University of Washington

ARBORETUM BULLETIN

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Concerning this issue . . .

For this issue, Graham Stuart Thomas, of international renown, has written a sumptuously illustrated article about the fascinating historical gardens of the National Trust in England.

We are also pleased to present the first of two articles on the plants of the beautiful Styracaceae, by Brian Mulligan.

In conjunction with the completion of the Tea House in the Japanese Garden, Audrey Ko writes about Chinese gardens, and provides insight into a contrasting style of Oriental gardening.

Continuing in the vein of visits to New Zealand, Edward Dunn reports his delightful experience at Pukeiti.

For those interested in improvements in their home gardens, Genie Stewart has written about shade-loving native plants, and Darcy Halloran about cuttings of choice ornamentals.

I regret that this *Bulletin* is too late to publicize the Arboretum Foundation Plant Sale (May 6 and 7) or the Northwest Ornamental Horticultural Society Fern Sale (June 19 and 20), but there will be the Arboretum Foundation Fall Bulb Sale, October 7 and 8, and the NOHS Fall Plant Sale (Museum of History and Industry). Further details of these sales will be publicized in subsequent *Bulletins.*

As the new editor, I would like to express my pleasure in bringing you my first issue of the *Arboretum Bulletin,* and to extend my thanks to all who have helped me with this issue. I particularly wish to thank Jan Pirzio-Biroli for sharing with me her time and her editorial expertise, and I wish her much satisfaction in her present capacity as Naturalist and Volunteer Coordinator at the Arboretum.

SUSAN LIBONATI-BARNES

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University of Washington

ARBORETUM BULLETIN

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COVER

Scotney Castle, Kent, a National Trust Garden.
'Picturesque' focus created in the 19th century from mediaeval buildings,
by Edward Hussey (see page 17).

Photo: Sheila J. Orme, courtesy of The National Trust

Memorial for Bob Van Denburgh

The Arboretum lost a good and loyal friend April 11, 1981, with the sudden death of Robert W. Van Denburgh. Bob joined the Arboretum staff in August, 1965 as Botanical Recorder after 30 years of service in the US Navy. Upon his retirement from the Navy as Lt. Commander, he earned a degree in Horticulture (Floriculture) from WSU in three years.

His obvious love of plants and friendly manner soon made him a favorite of the staff and visitors alike. During his eight years with the Arboretum he developed an extensive knowledge of the grounds and collections, knowledge which he put to good use when acting as guide to the many groups touring the Arboretum.

Bob retired from the Arboretum staff in 1973 but continued to volunteer his services, especially as a guide for the popular Explorers' Walks. In fact he lead a tour only a couple of weeks before his untimely death.

He left his mark on the Arboretum and on those who were privileged to know and work with him. He will be missed.

JOSEPH A. WITT

Announcements from the Unit Council

Since last September the Foundation welcomed 233 new members and now has a membership of 2928. One-hundred eight of the new members are also Unit Council members and their membership has reached 1523. These are current and active members. A letter of welcome is being sent to new members telling them of the membership privileges and inviting them to a special Arboretum tour ending in the greenhouse, where they will choose a few cuttings and learn how to propagate them.

SUMMER CUTTING PARTIES, 1981. The Education Committee will sponsor a series of cutting parties for those who wish to learn plant propagation and for experienced gardeners who wish to expand their collections.

Weds. July 8	Lee Clarke's (Variety of select material)	10:00 AM - 12:00 PM	Limit 8
Mon. July 13	Greenhouse (Choice Arboretum cuttings)	11:00 AM - 1:00 PM	Limit 8
Thurs. July 23	May Belle Johnson's (Rhododendrons and other Ericaceae)	10:00 AM - 12:00 PM	Limit 8
Weds. July 29	Mary Ellen Mulder's	10:00 AM - 12:00 PM	Limit 8
Thurs. Aug. 6	Gwen Bell's (Choice Rhododendrons)	10:00 AM - 12:00 PM	Limit 8
Tues. Aug. 18	The Mulligans'	10:00 AM - 12:00 PM	Limit 8

All materials will be supplied. Please list first and second choices. A check for $5.00 should be sent to: Margaret MacLeran, 4708 154th Place S.E., Bellevue, 98006. Phone: 747-1899. Make the check payable to Arboretum Foundation — "Cutting Class". You will be contacted about your choice as soon as possible. Parties strictly limited, as requested by hostesses.

The 1981 BULB SALE will be held on October 7th and 8th. Chairmen Jeanne Gardiner and Jane Rogers request that you let them know this spring if you wish to order special kinds of bulbs in large quantities.

MOLLY WOLFE

Pterostyrax hispidus **in full bloom.** **Photo: W. Eng**

The Styrax Family in the Arboretum

BRIAN O. MULLIGAN

Editor's Note: The beauties of the members of the Styracaceae make them deserving of more horticultural attention than has been previously accorded. They produce abundant flowers in early summer, change leaf color in autumn, and reveal strong branching patterns in winter. This survey and history of the Styracaceae in the Arboretum is arranged alphabetically. The first four genera will be presented here. The genus Styrax *will appear in the next issue.*

Of the twelve genera placed in the family Styracaceae five are well represented in the University of Washington Arboretum, namely *Halesia, Pterostyrax, Rehderodendron, Sinojackia,* and *Styrax.* These are predominantly of Asiatic origin. *Styrax* is the largest genus in the family, with 160 species distributed from southern Europe (Italy) eastwards to China, Japan, and Malaysia, and westwards into both North and South America, as far south as Peru, Brazil, and Uruguay. China alone holds about 42 species, or one quarter of all those known. The next largest genera are *Alniphyllum* and *Rehderodendron* with eight species each, and then *Pterostyrax* with six; no other has more than three. *Halesia* is primarily an American genus, with one species in China.

Horticultural Attributes

The number of species of the Styracaceae in cultivation is rather small. The Arboretum possesses six species of *Styrax,* two each of *Pterostyrax* and *Halesia,* one *Rehderodendron* and one *Sinojackia.* Some of these are quite rare in cultivation but well worthy of greater use in our

gardens along the Pacific coast.[1] *Halesia* and *Pterostyrax* are definitely trees, although sometimes multistemmed if not carefully pruned in their youth; some have attained 45-50 feet in height at the Arboretum in thirty years or less. *Rehderodendron* is also a small tree but not as tall; *Sinojackia* is a large multistemmed shrub. Amongst *Styrax* we find both trees such as *S. japonicus* and *S. obassia,* and shrubs including *S. officinalis* and its variety *californicus* and the charming Chinese *S. wilsonii,* now unfortunately lost in the Arboretum. Their value lies chiefly in the numerous white snowdrop-like flowers produced in summer, often fragrant and sometimes displayed in great quantities. Such a display can be seen on the old trees of *S. japonicus* located on the lawn outside Anderson Hall on the campus of the University of Washington, and also across the road at that point. In *Halesia* the flowers appear earlier, in May, before the leaves have fully developed, and consequently show themselves to better advantage, especially against a blue sky. In autumn, the orange to yellow coloring of the leaves before they fall also has considerable value in the garden, particularly in *Styrax obassia. Styrax japonicus, Halesia tetraptera* and the *Sinojackia* show paler yellow autumn color. The peach-like foliage of *Rehderodendron* becomes darker and more reddish in October and November, persisting until removed by frost, wind and rain. All species are deciduous, and during the leafless winter months the strong and definite branch patterns of most of the tree types are very noticeable, particularly in *Styrax obassia* and *S. hemsleyanus* with their upright form, in *S. japonicus* in which the branching is horizontal, and in the species of *Rehderodendron* and *Pterostyrax*. Propagation is usually by means of seeds, but summer cuttings are also possible, preferably under mist or a similar enclosed system.

HALESIA

Nomenclature

This generic name was given by Linnaeus in honor of Dr. Stephen Hales, author of *Vegetable Staticks* (1727, and later editions), at the suggestion of John Ellis of London, a correspondent of Linnaeus'. The nomenclatural history of *Halesia carolina* and *H. tetraptera* is complex but has now been clarified by the painstaking work of Dr. J. Reveal and M.J. Seldin (1976). The following paragraphs summarize this history.

The silverbell or snowdrop tree has long been known as *Halesia carolina,* a name which Linnaeus provided in 1759 for specimens collected by Alexander Garden at Saluda, South Carolina. These were gathered in the summer of 1755 and sent to John Ellis the following year. Seeds of this newly discovered tree were also sent to him in 1756 and germinated the following spring. The famous artist Georg D. Ehret in 1756 made a drawing from the Saluda specimens, but only a copy of this now survives.

In 1761, John Ellis published his account of *Halesia* in an article entitled "An Account of the Plants *Halesia* and *Gardenia*" in a letter to Philip Webb, Esq. With it he published a reverse image of Ehret's plate. Ellis published two species of *Halesia,* namely *H. diptera,* and *H. tetraptera,* the former having two-winged and the latter four-winged fruits. The specimens of *H. tetraptera* had been collected by Garden near the Santee river, northwest of Charlestown, South Carolina, now Charleston. Ellis modified Linnaeus' description but made no mention of *H. carolina.* No type material of either *H. carolina* or *H. tetraptera* now survives.

Although Linnaeus had proposed the name *Halesia carolina* in 1759, it quickly lost favor, and with the publication of Ellis' 1761 paper, even Linnaeus adopted *H. tetraptera,* not realizing that the two are distinct species.

In 1958, R.K. Godfrey, unaware that Ehret's plate did not represent the original material of *Halesia tetraptera,* suggested that this drawing represented another species, *Halesia parviflora* (described by Michaux in 1803) which is native from Florida into South Carolina.

Finally, Dr. J.L. Reveal and Margaret J. Seldin (1976) concluded that:

1) Linnaeus' original *Halesia carolina* is the plant drawn by Ehret, and it includes Michaux's *H. parviflora.* Its range extends from Florida north to South Carolina, west to eastern Mississippi.

2) *Halesia tetraptera* Ellis is the plant usually grown as the silverbell tree, "H. carolina", of

[1] *The Annotated Checklist of Woody Ornamental Plants of California, Oregon and Washington,* published by the Division of Agricultural Sciences of the University of California in February 1979 (#4091) includes no more than these, and in fact omits several of those growing in Seattle.

gardens. It has a wider range, extending from northern Florida to the Virginias, and west to southern Illinois, Kentucky and Tennessee. Its variety, *monticola,* is chiefly found in the hills and mountains, from Georgia to North Carolina, west to Oklahoma and perhaps to Texas.

3) *Halesia diptera* Ellis, with its two-winged fruits, is quite distinct from the others. It has a variety, *magniflora,* with larger flowers than the normal type. Its range is from Florida to South Carolina, west to Arkansas and east Texas.

So rests the nomenclature and history of this native tree.

Halesia tetraptera

Halesia tetraptera is now well distributed throughout the Arboretum and over a period of about thirty years has proved its ease of cultivation and value as a useful flowering tree for this region. The pendulous, nut-like fruits, at first green then becoming brown when mature in November and December are another interesting feature in fall and early winter, although unfortunately attractive to squirrels. Because of its potential size the tree needs some space to develop properly, particularly the larger variety *monticola,* which in the wild state has been known to attain 80 feet in height. Our trees in Seattle are already more than half that height, in a comparatively short time period.

A young tree of *Halesia carolina* in flower near Rhododendron Glen. Photo: E.F. Marten

***Halesia carolina* in fruit (November). Photo: E.F. Marten**

The oldest trees of *Halesia tetraptera* in the Arboretum are those beside Arboretum Drive, on the bank east of the parking area facing the head of Rhododendron Glen. These originated as seeds from the Boyce Thompson Arboretum, Yonkers, New York, in 1941. Six were planted in February 1947, but three were removed later to allow more light on the shrubs beneath them. The three remaining are now from 36 to 44 feet in height, 11-12 inches in trunk diameter at breast height (d.b.h.). They are still growing vigorously having added 1½ to 2 feet to their height in 1980.

Five plants were set out (as *Halesia monticola,* from an unrecorded source) in January 1948 on both sides of Azalea Way, south of its junction with Loderi Valley. The largest two are now fine trees averaging about 45 feet in height, with trunk d.b.h. of 12 and 9 inches. They flower and fruit freely each year and are well suited to their location, with azaleas beneath them. Others have been placed in the Winter Garden (1950) and on the north side of the crew room (1952). The latter was raised from seed received from the Morris Arboretum, Philadelphia, and is now a multistemmed specimen 19 feet tall. Another was set out on the south bank of Rhododendron Glen below the look-out in 1954, having been received two years earlier from the Arnold Arboretum, Boston. It is now 42 feet in height,

drawn up by adjacent native maples and other trees. In 1955 another from Morris Arboretum seeds was planted on the bank on the east side of Azalea Way near the birches; this has become a fine tree now about 48 feet in height with two trunks 8 and 7½ inches in diameter. Several others can be found on the north side of Rhododendron Glen, planted in 1957 amongst the rhododendrons, over which they now hang and form a conspicuous sight when in bloom, visible above from Arboretum Drive. Later plantings were made on the bank behind the stone cottage near Madison Street and in the area north of the East Lynn Street footbridge over the Boulevard.

Halesia carolina

Halesia carolina L. is separated from *H. tetraptera* Ellis by its smaller flowers less than 1.5 cm (½ inch) long, the style well exserted from the corolla with the anthers at or beyond the mouth, and the narrower, club-shaped fruits. It is possible that some plants in the Arboretum are this species and not *H. tetraptera,* a question which can only be decided when they are in flower.

Halesia diptera

Halesia diptera, as we have noted, has a smaller natural range than *H. tetraptera,* very similar to that of *H. carolina.* Both just extend into South Carolina from the south but *H. diptera* ranges farther west, to Arkansas and east Texas.

The two small trees in the Arboretum (now about 20 feet in height) derive from seeds received from the Morris Arboretum in 1949. They are both located on the east side of Arboretum Drive. One grows almost opposite the top of Rhododendron Glen, near the oldest *Halesia tetraptera* trees. The other is located a little way to the south, in the grass beside a bed of camellias. Planted in 1957 and 1964 respectively, they were both seen to flower sparsely for the first time in early June 1980. The scentless flowers are borne in small corymbs of about five on last year's shoots and are similar to those of the silverbell tree. They are about 2 cm (¾ inch) long, the four petals divided almost to the base, the slender pedicels, the sepals and ovary all pubescent, the style and stamens shorter than the corolla. The young shoots, petioles and both sides of the leaves are also stellate-pubescent. The leaves are ovate to oblong-ovate, generally 8-10 cm (3-4 inches) long by 6-7 cm (2½-3 inches) wide, abruptly acuminate at the tip, with the margins irregularly serrate. In early October the fruits are well-developed but still green, each 3-4 cm (1-1½ inches) long, 2.5-3 cm (1-1½ inches) wide, with two broad semi-transparent wings. The pedicels are 2-2.5 cm (¾-1 inch) long and slender for the size of the fruits. Two months later, when the fruits are fully mature, they are pale brown with the wings thinner and tougher.

Although smaller than *Halesia tetraptera* and with a pleasing habit of growth, the shyness in flowering would certainly discourage anyone from trying to grow this species, particularly when *Styrax japonicus* is so easily available and is a better performer in a shorter time. Perhaps the variety *magniflora* from the uplands in northern Florida might be a better plant than the type for our climate, if seeds or plants could be obtained. It has been successful in both French and Belgian arboreta (Bean, 1973).

There is another species of *Halesia* in eastern China, *H. macgregorii* which so far as I am aware has not yet been introduced to western gardens, and which may have horticultural value. Seeds of this species, collected in China, were received at the Arboretum in February 1981.

Halesia is distinguished from *Styrax* and *Pterostyrax* by having only four lobes to the corolla instead of five, as well as by the winged fruits 2.5 cm (1 inch) or more in length.

Fruits of *Pterostyrax hispidus*. Photo: Courtesy of the U. of W. Audio-Visual Production Services

PTEROSTYRAX

This small genus of six known species was first published when the botanists F. von Siebold and J.G. Zuccarini described both *Pterostyrax corymbosus* and *P. hispidus* in their *Flora Japonica* in 1835. These Japanese species also occur in various areas of southeastern and central China. The other four species are all of Chinese origin, mostly from southeastern China; there-

fore they would be unlikely to be hardy here even if introduced. *Pterostyrax* differs from *Styrax* in possessing an inferior or nearly inferior ovary; the fruits also are winged or ribbed, often very hairy, quite different from those of the cultivated species of *Styrax*.

The first to be planted in the Arboretum was *Pterostyrax hispidus,* the epaulette tree, raised from seeds received from Mr. Carl S. English, Jr., Seattle, in November 1950. One plant from this source flowered in June 1955, but was damaged by unusually high temperatures that same month (up to 99° F.) and subsequently killed by the severe early freeze in November of that year. In December 1950 two others were planted from another source, the Nikko Botanic Garden in Japan, from seeds received in January 1948. One was placed by the fence on the east side of Arboretum Drive just south of Rhododendron Glen, the other in a new bed of rhododendrons and azaleas just west of the Magnolia Section. The soil in both places is light and sandy. Both plants are still thriving, the former having attained 45 feet and the latter about 35 feet, partially suppressed by an overhanging bigleaf maple. Both flower and fruit freely each year and are conspicuous spectacles during two seasons — late May to early June and October to December.

The leaves are large, ovate, up to 20 cm (8 inches) long, 7.5-10 cm (3-4 inches) wide, acuminate at the tip, serrulate to the base. They have eight to ten pairs of veins, which are particularly hairy beneath. The scentless flowers hang in loose, leafy panicles from last season's branches, each about 15 cm (6 inches) long and having ten to twelve branchlets each with four to twelve flowers, borne on densely pubescent pedicels; the individual flowers are about 1 cm (½ inch) long, having five white petals split to the base and shorter than the stamens. The fruiting panicles are 15-18 cm (6-7 inches) long, noticeably white-hairy, with seven to twelve fruits on each of their branchlets; they ripen from late October into November.

The total effect of these hundreds of white tassels dangling from the tree's branches is striking, unlike anything else in the Arboretum. A similar sight occurs again in the fall, when the hairy fruits gradually ripen, changing from green to pale brown and often remaining until December. The bark and the branches are tan-brown in color, the wood soft and light. The trees may, like *Halesia tetraptera,* be either multi- or singlestemmed. The latter condition is preferable; if necessary, young trees should be pruned to one stem.

Pterostyrax corymbosus

The second species growing here, *Pterostyrax corymbosus,* was acquired as small plants from Mr. English in January 1957. Two eight foot specimens were planted in February 1960 on the east side of Arboretum Drive opposite the Camellia Collection. In December that year a third was placed on the west side of Azalea Way adjoining older plants of *Styrax japonicus* and *S. obassia.* The two former are now 32 feet and 40 feet in height respectively, forming a very attractive pair of singlestemmed trees. The third tree has divided into a number of branches, probably due to winter damage in its earlier years, and is only 15 feet in height. The site is poorly drained and much wetter in winter than the other location.

The leaves of *Pterostyrax corymbosus* are distinctly smaller than those of *P. hispidus,* oblong-ovate to obovate in shape, 10-14 cm (4-5½ inches) long, 6-7 cm (2¼-2¾ inches) wide, with only five to seven pairs of veins. The leaves are stellate-hairy on both sides but more so beneath and on the veins, and are shining on the upper surface. Flowering (first noted in 1969) occurs slightly earlier in May than in *P. hispidus.* The inflorescences likewise hang beneath the branches, each with 20-30 lemon-scented white flowers. The petals are spoon-shaped, about 4 mm (⅜ inch) long, and shorter than the ten stamens. The stalk and the calyx-cup (hypanthium) are densely stellate-hairy. The fruits ripen gradually from October into November and December with, as a rule, up to nine on each inflorescence. They are obovate in shape, about 1.3 cm (½ inch) long, 0.6 cm (¼ inch) wide, with four to six ribs. The dried style often remains attached for some time. No fertile fruits have so far been found on Arboretum specimens so it may be necessary to obtain fresh seeds from Japan or to practice vegetative propagation in order to reintroduce this attractive flowering tree.

REHDERODENDRON

This wholly Chinese genus was named for Alfred Rehder, distinguished botanist at the Arnold Arboretum for 42 years (1898-1940). The first known species were described by Professor

H.H. Hu in 1932 — *Rehderodendron kweichowense*, *R. mapienense* and *R. macrocarpum* — the last two coming from Szechuan province in western China. *Rehderodendron macrocarpum* was said to be common all over the upper part of Mount Omei in that province, up to 10,000 feet elevation, but had somehow been overlooked by E.H. Wilson when he visited Szechuan several times from 1900 onwards (Hu, 1940). Five more species were described during the next three years, all from south or southwestern China (Kwangtung or Yunnan).

Rehderodendron differs from *Styrax* in having a completely inferior ovary, as well as in the large, woody ribbed fruits. It is more nearly related to *Pterostyrax*.

Rehderodendron macrocarpum

Of all these species, only *Rehderodendron macrocarpum* has been introduced to western gardens in either the United States or in Europe.

This tree came to the Arboretum as two small plants sent by William Judd, then propagator at the Arnold Arboretum, in April and August, 1938. The first was two feet high when sent

Fruits and Leaves of *Rehderodendron macrocarpum*.
Photo: E.F. Marten

Flowers of *Rehderodendron macrocarpum* against the sky.
Photo: B.O. Mulligan

(anon., 1938). The seeds had been sent to the Arnold Arboretum in 1934 (Bean, 1976). Since other seedlings at the Arnold Arboretum were killed by cold weather (Hu, 1940), those sent to Seattle and to England were the only survivors. One original plant now remains in our Arboretum (Witt, 1958). One of the two original trees in England, growing in Cornwall, had attained 36 feet in height by 1971 (Bean, 1976) and no doubt is even taller by this time.

The plants received here were grown in or adjacent to the upper lath house until October 1949, by which time they had lost their identification and one plant had died. The survivor, then about 6 feet in height, was planted out at the edge of the bed of *Rhododendron kaempferi*, just north of the Winter Garden. When the flowers were first observed in May 1954 (by which time the plant was 10 feet tall) we were able to identify it as *Rehderodendron macrocarpum* and to trace its origin by the entries in the acquisition book in 1938. By 1964 the small tree was 17 feet tall and was flowering and fruiting regularly; it is now up to 22 feet. In most seasons it is in full bloom by the first week of May, but time of flowering is variable, depending upon the weather of the particular season.

The alternate leaves somewhat resemble those of a peach tree, being lanceolate, 10-15 cm (4-6 inches) long, about 5 cm (2 inches) wide, acuminate at the apex, cuneate at the base and crenate-serrate along the margin. The leaves have seven to ten pairs of veins, and are pubescent chiefly on the underside of the veins. The red petioles are about 1 cm (½ inch) long. The young shoots are light brown and those two years old are gray-brown and smooth. The flowers, like those of *Halesia tetraptera,* happily appear as the young leaves are developing but have not fully opened. The flowers are borne in

Flowering branch of *Sinojackia rehderana*.
Photo: B.O. Mulligan

short panicles of four to seven, at the leaf joints of the previous year, on pedicels up to 1.3 cm (½ inch) long. The flowers are open-campanulate in form, nearly 2.5 cm (1 inch) long and wide, with white petals and pale yellow, exserted stamens. The lemon-like fragrance is strong. The fruits are oblong, 6 cm (2½ inches) long and more than 2.5 cm (1 inch) wide; at first green, then reddish, finally becoming brown and woody. Squirrels, unfortunately, are attracted to them. The seeds are one or two to each fruit, and like those of *Davidia,* take at least two years to germinate. Fortunately, our plant has proven to be self-fertile.

Following the 1955 flowering, fruits were collected and plants raised from them (Witt, 1958). One plant was set out in spring of 1961, a little to the west of the original tree, and is now 21 feet tall. Another was set out in spring 1963 on the bank at the west end of Woodland Garden. It is now 27 feet tall. A third tree planted in December 1957 at the top of Rhododendron Glen was most probably raised from a cutting from the original specimen. It is now the finest example in the Arboretum, at 33 feet in height. It can be seen alongside the trail leading to the look-out. When in bloom in April and May, the delicious scent betrays its presence above the visitor's head. Since 1957, but particularly in 1970 and 1971 *Rehderodendron macrocarpum* has been propagated from cuttings and seeds and sent to other arboreta. Thus, its hardiness is being tested in climates such as those of Philadelphia, New York and Washington, D.C. There is no question but that it is a valuable small flowering tree for the Pacific coast states west of the Cascade range, and probably also for some regions near the eastern seaboard, perhaps from Delaware and Maryland southwards. Time will provide the answer.

SINOJACKIA

Like *Rehderodendron,* this even smaller genus of only two species of shrubs or small trees from China was originally founded by Professor Hu in 1928, and named in honor of J.G. Jack, dendrologist at the Arnold Arboretum. Professor Hu found the tree growing in a suburb of the city of Nanking. He named it *Sinojackia xylocarpa,* describing it as "a small tree about 20 feet high. In April it bears a profusion of showy pendent long-pedicelled pure white flowers 3/4 inch in diameter, which at first sight suggest some species of *Styrax,* or the Snowdrop trees, the *Halesias*" (Hu, 1940). From the drawing accompanying Hu's article the tree is evidently very similar to *Styrax japonicus* in its flowering state, although the blunt, oblong fruits are certainly quite different.

Sinojackia rehderana

A plant which was presumed to be *Sinojackia xylocarpa* was imported from the Hillier Nursery in England in January 1949 and planted out amongst the hydrangeas at the top of Rhododendron Glen in November 1951. However, when it flowered in May 1954, it proved to be *S. rehderana,* a species described by Professor Hu in 1930, and which differs both in flowers and fruits from *S. xylocarpa.* The specimen of *S. rehderana* is now 26 feet in height. Seeds of the true *S. xylocarpa* were received at the Arboretum in February 1981 from the Shanghai Botanic Garden, so we may someday have specimens of this plant in our Arboretum.

Sinojackia rehderana, however, has proved quite successful in the Arboretum for almost thirty years. It was first planted near the head of Rhododendron Glen in March 1951, flowered in May 1954, and fruited sparsely that October. Unhappily, this particular plant died later from an unrecorded cause, although perhaps damage from the exceptionally early and severe

Leaves and one fruit of *Sinojackia rehderana*.
Photo: B.O. Mulligan

freeze of November 1955 may have contributed to its demise. Another plant, grown from a cutting, was planted out in March 1958. It was placed on the westerly slope at the north end of the parking lot facing the Glen, in very sandy, well-drained soil. Since the plant now flowers profusely each year in May or early June, this is evidently the kind of situation it enjoys.

The ovate-lanceolate leaves, thin but tough, are 8-11 cm (3-4½ inches) long, 3-4.5 cm (1-2 inches) wide, short-acuminate, and cuneate at the base. They are shining on both sides but more so beneath, with four to six principal veins which are prominently raised on the underside. The leaves are glabrous except for a few scattered hairs along the midrib beneath. The young shoots, petioles and pedicels are all dotted with stellate hairs.

The scentless flowers hang in loose cymes beneath the branches, about six in each inflorescence, arranged in pairs on very slender pedicels. They are starry in appearance, opening widely to 2 cm (about 1 inch) across. The petals are in sixes, 12 mm (½ inch) long, and white; the sepals are lanceolate, 2 mm long, and acute; the ovary is cylindrical, 5-7 mm (.2-.3 inches) long, and stellate-pubescent. The elongated, tapered and pointed fruits ripen in October, turning from greenish to brown. They are 1.5-2 cm (½-1 inch) long, 5-7 mm (.2-.3 inches) wide, and contain a single seed. Fruits have been sparingly produced on both the Arboretum plants.

This large shrub is of approximate size and similar garden use to *Styrax japonicus*. It flowers slightly earlier in the season, the inflorescence is lighter and more airy, the individual flowers open more widely but are somewhat smaller than those of the *Styrax,* and they lack its fragrance. Nevertheless, *Sinojackia rehderana* offers a fresh kind of flowering for our late spring and early summer gardens. It should be propagated and distributed for trial over a wider range of climates than that of Puget Sound.

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KEY to GENERA of STYRACACEAE in ARBORETUM
(Adapted from H.H. Hu, 1940, and J. Hutchinson, 1967)

A Ovary and fruit superior to sepals and petals ..... *STYRAX*

AA Ovary and fruit partially or wholly inferior

B Calyx and corolla 4-toothed or 4-lobed ..... *HALESIA*

BB Calyx and corolla with 5 or more teeth or lobes

C Flowers in spring before the leaves develop; fruit large (6-7 cm long), woody when mature ..... *REHDERODENDRON*

CC Flowers with the leaves in late spring or early summer; fruits much smaller

D Inflorescence in axillary cymes; fruits not winged; ovules 8 in each cell ..... *SINOJACKIA*

DD Inflorescence a terminal panicle; fruits ribbed or winged; ovules 4 in each cell ..... *PTEROSTYRAX*

A Chinese landscape, inspiration for the Chinese garden. An ink and color work by Shao Mi, 1638, late Ming Dynasty.
Courtesy of the Seattle Art Museum, Eugene Fuller Memorial Collection

Chinese Gardens: Principles of Design

*AUDREY A. KO**

Editor's Note: China is one of the places in which civilization and the practice of cultivation first developed. Although the earliest description of a Chinese garden dates only from the second century BC, by that time these gardens were the sophisticated products of a long creative tradition. The concepts of these romantic landscape gardens have survived relatively unchanged for twenty-five centuries (Hyams, 1971). Chinese gardens differ strongly from the formal trends in Europe and in other parts of Asia, and have some features in common with the English landscape gardens of the eighteenth century. Chinese and Japanese gardens have both similarities and differences. They have in common reverence for stones and a use of symbolism. Japanese gardens include fewer flowers, and plants are usually trimmed in order to represent their essence. The Japanese Garden in the University of Washington Arboretum embodies the features of Japanese gardens, and provides a comparison with the present vision of Chinese gardens presented here.

The design of Chinese gardens is a topic which is rarely discussed. Few people realize the importance and influence of Chinese garden and design principles on gardens throughout the world. This could be due to several factors, among which are the Communist influence in China, which severely restricted travel and communication, the tendency of the Chinese people to not "advertise" their gardens (or anything), and the fact that most Chinese gardens were private and for personal use rather than for the public. This paper will discuss the basic principles of design as well as the elements of the Chinese garden and their uses and symbolism.

The Chinese garden began as an appreciation

*Audrey A. Ko is a recent graduate of the Landscape Architecture program at the University of Washington. Her paper stems both from her interest in landscape and from her Chinese heritage.

of the wilds. It served as a retreat for people who recognized the positive effects of solitude, and was meant to be a refuge for meditation, contemplation, and peace. It was a private place that yet offered protection and that allowed one to be in the open air and to enjoy the landscape. No marked distinction was made between indoors and outdoors. The garden was an extension of the dwelling.

The garden was to contain the essence of the world with all in proper balance; it was the embodiment of a philosophy of life. It was not an imitation of nature but the evocation of a memory. It left much unsaid so that the viewer could complete the ideas with imagination and inspiration. It was a striving for harmony between the elements and people and their buildings. It included irregular and unforseen features to surprise and delight. It was an apparently endless succession of isolated sections to be discovered in stages. It was a series of corridors and courts that was meant to be wandered through. It tempted the viewer — tantalized with glimpses of vistas which would appear through gateways or ornamental openings.

Chinese gardens consisted of several elements. These included walls, corridors, and curved paths; earth, rocks, water, and plants; and such structures as bridges, pavilions, gateways, and openings in walls.

There was no formula behind the design of Chinese gardens. They were surrounded by high walls and generally had few straight lines. Paths curved so that what was ahead remained hidden. Views would spread open from certain points, but from no place could the entire garden be seen. There were no open stretches of ground. Rocks separated large spaces, and natural scenery was borrowed from beyond the walls of the garden. Although buildings were prevalent, they were never massive. Symmetry was shunned, color displayed sparingly, and the use of grass avoided because it left only a void. There was no stiffness or regularity in the Chinese garden, and moderation characterized its philosophy.

The elements of the garden were very important and most had special meaning. Earth, water, fire, air, wood, and metal were the elements of symbolism. Earth was represented by hills and islands, and symbolized excitation. Water, in the form of ponds, streams, or waterfalls, indicated tranquillity. In addition, it had a cooling effect in the warm summer months. Rocks were a very significant element. They stood for longevity and were a substitute for landscape in dreams. They were the earthly counterpart of clouds and contrasted light and shade. Thus they were prized for their oddity of form and were used as monuments or to separate large spaces. They also symbolized metal. Rocks were usually made of limestone shaped by strong currents of water. Though they were originally quarried from the bottoms of lakes, as they became more in demand and harder to find, people began to produce them artificially by placing limestone blocks in waters where there were forceful currents to carve and shape them. Mountains were part of the creative image, and were often represented by peculiar rocks. Plants were generally free from artificial trimming or shaping. They were chosen to be at their peak during different seasons so that there would always be something to view. The element of wood was symbolized by trees, and the element air by the wind rustling through their branches. Among the more common plants used were junipers, pines, elms, willows, maples, cedars, cypresses, magnolias, cherries, plums, apricots, peaches, pomegranates, bamboos, palms, and bananas. Flowers each had a special significance and aesthetic value. Favorites included wisteria, jasmine, orchids, peonies, gardenias, hibiscus, chrysanthemums, lotus, and narcissus. Fire was symbolized by glowing flowers. Both fruit and fragrance were important to the Chinese.

Symbolism of some favorite Chinese plants

Bamboo: grace, culture, fidelity, constancy, humility, wisdom, long life, and gentleness; *chrysanthemum:* fidelity, refinement, gentility, longevity, vitality, and opulence; *gardenia:* graceful charm; *lotus:* purity and truth; *magnolia:* fragrance and virtue; *narcissus:* good fortune; *orchid:* courage and endurance, essence of refinement, culture, and nobility of character; *peach:* immortality; *peach and plum blossom:* cordial relationship and physical charm; *peony:* fidelity, refinement, vitality, opulence, wealth, and honor; *pine:* robustness, dignity, and integrity; *pomegranate:* fertility; *willow:* grace, friendship, purity, mercy, suppleness, and pliability.

Architectural elements

Architectural elements played a strong role in the Chinese garden. Walls were used either to separate or to join spaces. In plan they curved or angled and their tops were serpentine and often roofed with tile or thatch. Generally, walls were made of earth, brick, or stone, and were often whitewashed. Gateways or openings were shaped distinctively — a moon, a vase, or a flower petal. They looked out on the garden and afforded the passage of moonlight. Their object was to beckon the wanderer by allowing glimpses of something special just beyond the opening. Geometrical lattice work was mainly a part of windows. It symbolized blessings, happiness, abundance, and long life. Balustrades were similar to lattice work but they functioned as railings. They were mostly made of wood and also were adorned with a geometric motif. Paths, like walls, were winding. They were paved in elaborate mosaics of recycled materials such as stone chips, broken tile, porcelain fragments, marble, or stone slabs, and often had a decorative border of shingles. Covered ways were roofed structures with open sides, and were used to connect either parts of buildings across the garden or different elements in the garden. They varied in plan and in level of decoration. Furniture generally consisted of garden seats and tables of stone or porcelain. Bridges were usually made of stone, marble, or timber, or of flat stones if the water was shallow. Sometimes they were angled like paths so that evil spirits might not cross the water. Bridges were also high rounded arches that when reflected in quiet water were a symbol of abiding peace and harmony. Pavilions, outdoor rooms open on all sides, were generally geometric in plan and had pointed and tilted roofs. These were used in the garden as a focus of interest.

The design of Chinese gardens relied primarily on aesthetic considerations. The designs were the products of a sophisticated art closely related to Chinese painting. They were expressions of the spirit and depicted harmony and order in nature. They were subtle, yet intricate, and always delightful and charming. Even though such ideas as symbolism in design are very different from landscape and garden design as we know it, the influence of Chinese design principles for gardens is still evident, though often overlooked. In our own gardens, latticework fences and iron railings in geometric patterns are reminiscent of Chinese principles.

Just to see and experience original Chinese gardens as they have been pictured and described, would add new perspective to our ideas. Given the changing attitudes and relations with China, we might now be able to visit some of these old gardens. The influence of the Chinese garden will not disappear.

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Winter breaks.
Spring drifts in...
The red hands of peonies
emerge from earth.

CAROL J. SLOCUM

Events of Horticultural Interest

FRIENDS OF THE CONSERVATORY in Volunteer Park have reserved the afternoons of the second Sundays in each month for special displays. Hours are 1-4 PM, at the Volunteer Park Conservatory. For more information call Priscilla Dickert, 486-3167. June 14—Seattle Begonia Society; July 12—Greater Seattle Fuchsia Society; August 9—Seattle Dahlia Society.

JAPAN/NORTHWEST, a KCTS 9 local production, offers a unique insight into the contributions the Japanese culture has made to the Pacific Northwest arts. This program, airing Wednesday, July 29, 9:30 PM, focuses on what seven Americans have chosen from the Japanese tradition. The film features vignettes of potters, architects, landscape gardeners and poets, as well as of Bonnie Mitchell, who is currently teaching the art of the tea ceremony in the Arboretum's Japanese Tea House.

WILDFLOWER POSTER AVAILABLE. A full-color poster showing 24 species of endangered, threatened or rare plants in Washington is available from The Mountaineers, 719 Pike Street, Seattle, WA 98101. The cost is $2.98 each plus tax; orders of 10 or more deduct 40% then add tax. Poster features *Lewisia tweedyi, Calypso bulbosa, Hulsea nana* and others. Information about each plant is also given.

For more information, call 623-2314.

CLOUD FLOWERS: RHODODENDRONS EAST AND WEST, an exhibition of 47 contemporary watercolours by Canadian artists. Plants featured are all *Rhododendron* species that are cultivated in Canada.

In celebration of the official opening of their Asian Garden component this special exhibition has been sponsored by The Botanical Garden of the University of British Columbia and developed by the Art Committee of the Friends of the Garden. The show consists of original watercolours of rhododendron species that can be grown in Canada. The extensive rhododendron collection at UBC is the result of 25 years of selective collecting and propagating, and these unique plants make up a major part in the new garden area devoted to plants of Asia.

The exhibition will be shown at the Fine Arts Gallery, basement of the Main Library, Main Mall at UBC, from May 5 to August 14, 1981 before travelling to other Canadian and United States localities.

The University of British Columbia, Vancouver, British Columbia, announces the dedication of the PHYSICK GARDEN, the FRANK BUCK SUNDIAL and the ASIAN GARDEN, May 12, 1981.

The Physick Garden, designed in 1976 by the Vancouver firm of Justice, Webb and Vincent Landscape Architects Ltd., was based on a 16th Century engraving of a monastery garden by the Dutch artist van de Heyde. The twelve beds are edged by brick and the garden surrounded by a closed yew hedge. Many of the plants found in the garden have their origin in the Chelsea Physic Garden, London, England. The development of the special labels found in this garden has been the responsibility of a committee from the Friends of the Garden.

The Frank Buck Sundial was designed by the firm of Justice, Webb and Vincent and is dedicated by the British Columbia Society of Landscape Architects to Professor Buck for his many horticultural contributions to the University of British Columbia during a span of more than twenty-five years.

The Asian Garden, 30 acres in extent, contains the principal *Rhododendron* species collection for the University. In addition, special collections have been established of magnolias, cotoneaster, rose species, maples, primulas, hostas and meconopsis. New acquisitions are woody plants of known Asiatic origin. The garden has been developed by selectively clearing openings in a coastal coniferous forest. Some of the oldest (approximately 500-600 years in age) native trees on the campus are found in this garden.

June-blooming *Carpenteria californica,* propagated in the Patricia Calvert Greenhouse. Photo: B.O. Mulligan

A Cuttings Expedition in the Arboretum

*DARCY HALLORAN**

The Patricia Calvert Greenhouse propagates many rare plants from the Arboretum which are difficult to find elsewhere. It is staffed by Arboretum Foundation Unit Council volunteers. Plants are grown from cuttings and seeds and are sold at the annual spring plant sale. The material for propagation is selected both from the Arboretum and from the members' gardens. This process of selection follows a definite pattern. We use *Cuttings through the Year* to decide which genera to propagate each month, *Woody Plants in the University of Washington Arboretum* to locate the species that would be available, and *Hortus Third* to select the most desirable varieties. Mr. Joseph Witt, Curator of Plant Collections, gives us permission to make cuttings in the Arboretum. Once armed with clippers, plastic bags, labels, spray bottles, books and notes, we set out to collect the cuttings along a preplanned route through the Arboretum. While on a cuttings expedition, we make notes on the location of plants for future trips, and look for plants overlooked in our research. Thus the above book process often works in reverse. Frequently, a request will send us in search of a special plant.

This morning the route starts just outside our greenhouse door with *Jasminum parkeri* which forms a cascading low mound. In the spring it is sprinkled with bright yellow flowers and would make a lovely addition to a rock garden.

As we pass the main greenhouses, there is an evergreen shrub with white, summer-blooming anemone-like flowers. It is a California native, *Carpenteria californica,* and in our region prefers sun and good drainage.

At the start of Azalea Way, azalea 'Quakeress' produces a display of white and pink variegated flowers in the spring.

Just before we reach the winter garden, a brilliant coral-red blaze of color under a fir canopy stands out, a combination of the flowers of *Rhododendron kaempferi* and the new foliage of *Pieris* 'Forest Flame'. The tree, *Rehderodendron macrocarpum,* grows just beyond, the stunning

*Darcy Halloran is a medical technologist turned horticulturist. She has been in charge of the Patricia Calvert Greenhouse for the past year.

white-flowered racemes appearing before the long, dark green leaves. It is beautiful when planted with rhododendrons.

In the winter garden, we take cuttings of *Hamamelis vernalis* 'Carnea', a low, dense, spreading shrub with red flowers in winter. The elliptical leaves are a rich dark green. This is an attractive *Hamamelis* for the smaller garden.

Lindera obtusiloba with large light green leaves and yellow flowers in winter is found in the Woodland Garden. Farther east grows *Fothergilla major* with the brush-like white inflorescences appearing before the leaves. The *Lindera* and *Fothergilla* are both tall multi-stemmed shrubs useful for screening and for providing a deciduous understory to the tall firs. They also provide fall color since the leaves turn yellow, orange, or purple-red.

As we leave the Woodland Garden and loop back to Azalea Way, we see *Cornus kousa* 'Milky Way'. It becomes a specimen tree for two seasons, with large flowers in June and red leaves and fruit in October.

If we take a loop from Azalea Way into Rhododendron Glen, the ledums, dense shrubs with narrow leathery leaves, grow along the stream drainage. Their tight white flower heads seem to sparkle, and the leaves of *Ledum groenlandicum* have a rusty-red tomentum beneath.

If your soil is sandy loam with good drainage, a dark green, small-leaved shrub like *Daphne retusa* or *Daphne tangutica* is a good companion plant to rhododendrons. Both have the usual fragrant terminal flower heads, rose-white and purple respectively. *Daphne retusa* makes a low dense mound while *D. tangutica* is more erect and open in growth. These plants are in a bed just off Arboretum Drive at the top of Rhododendron Glen where the soil is dry.

At the south entrance to the Japanese Garden, *Rhododendron viscosum* is planted, a graceful shrub with delicate white tubular flowers and a spicy fragrance.

Within the garden there is a beautiful variegated tree, *Cornus alba* 'Argenteo-marginata'. The leaves are edged in white and the stems are blood-red. The tree can be pruned and shaped, as it is here, or left to grow as a multi-stemmed shrub.

From here we start back to complete our morning's work, for growing in the lath houses adjacent to the greenhouse is a wealth of material. *Ardisia japonica* makes a choice ground cover with shiny green leaves. It has white star-like flowers followed by red berries; it needs overhead protection to prevent winter burn.

Muhlenbeckia axillaris is another ground cover. The angular branching pattern of the stems gives the plant a lacy appearance forming a prostrate mat.

Once an expedition is complete, we take the cuttings home to store overnight in a refrigerator. On Tuesday mornings at 9:30, the volunteer crew meets to make the cuttings and to do the other greenhouse chores. Cutting Parties will take place this summer.

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Hampton Court, although not associated with the National Trust, has an admirable formal garden, a copy of one from the late 17th century.
Photo: B.O. Mulligan

Gardens of the National Trust, England

*GRAHAM STUART THOMAS**

Editor's Note: We are very pleased to be able to print this article on the National Trust, many of whose gardens illustrate aspects of landscape perception discussed by Elizabeth Rivers in her article "Aspects of Landscape Perception", Arboretum Bulletin, Vol. 43, No. 4, 1980.

After the last war, it was obvious to many in England that the restoration and even maintenance of our greatest gardens would impose a heavy and perhaps impossible burden upon their owners. Accordingly in 1949, a joint committee was formed by the Royal Horticultural Society and the National Trust to look into these difficulties and if possible to devise some means of help. The National Trust had been formed about 50 years earlier, and is a private charity devoted to the preservation of places of historic interest and natural beauty. Although surrounding some of its great houses it had gardens of importance, its terms of reference did not specifically include the preservation of gardens. The new committee settled to work quickly and thus was able to recommend the Trust's acceptance for preservation of such renowned gardens as Hidcote, Bodnant and Nymans, followed soon after by Sheffield Park Garden, Trengwainton and others. The Committee raised a large sum of money to make all this possible, since some of these gardens were accepted without adequate endowment.

A very great help, over the years, has been the many thousands of pounds given to the Trust annually from the proceeds of the National Gardens scheme, sponsored by the Queen's Institute of District Nursing; the many private gardens in the country open for this charity thereby help directly to preserve others. And we are fortunate, too, in having awakened interest

*Graham Stuart Thomas for many years was the Gardens Adviser, and is now Gardens Consultant to the National Trust. He is a photographer, artist, writer, and lecturer on horticulture, and is the author of many books, including Great Gardens of Britain, 1979, Mayflower Books Inc., New York, N.Y.

in the many who remember us in their wills and contribute to our cause in other ways. Particularly should I add here that, though not necessarily concerned with our gardens, we owe a very real debt to the Royal Oak Foundation, inaugurated in New York in 1975; our heritage is also America's and there are many properties of special mutual interest.

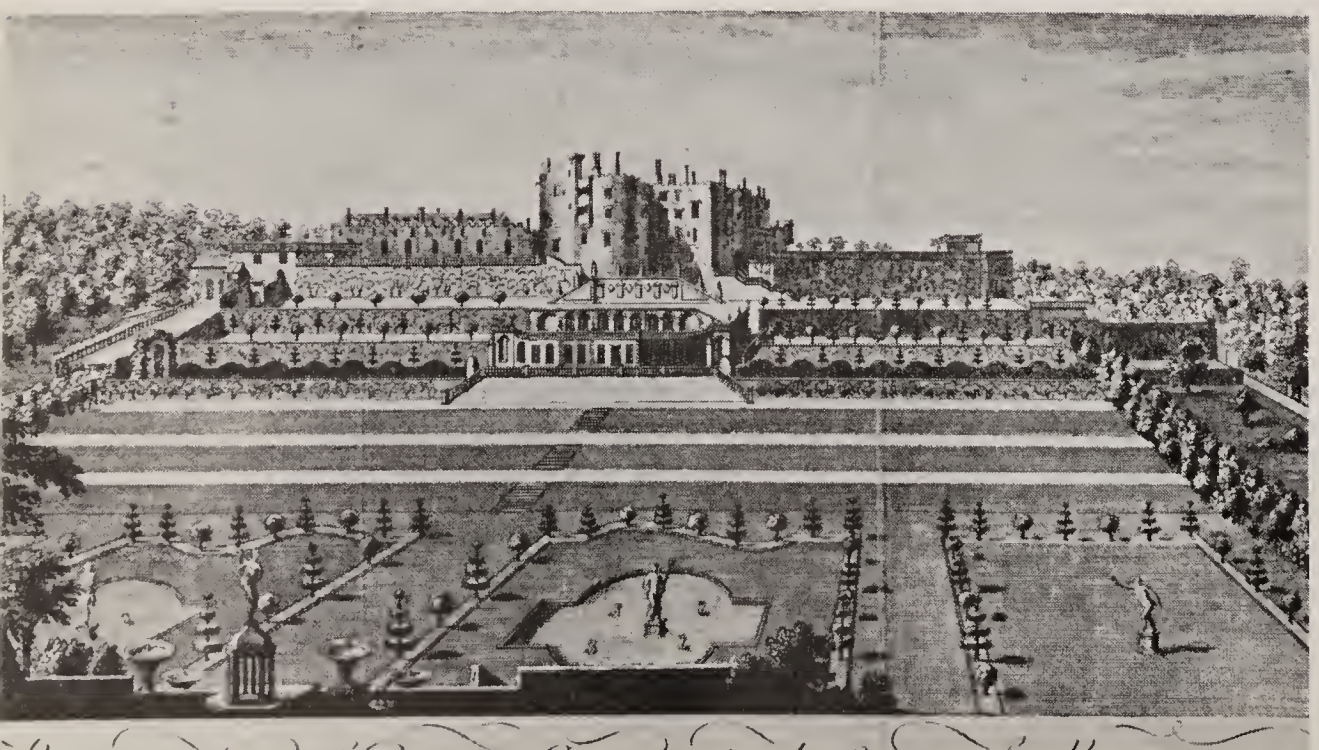
The National Trust is managed by a voluntary Council and Committees with a Head Office staff in London and further voluntary committees and Regional staff throughout the country. Its affairs have always been run very economically and today with about half a million acres and close on a million members it is remarkable that paid staff, including those at the properties, are kept to a minimum. There are sixteen Regions throughout England, Wales and Northern Ireland, and the staff are able to call on the expert help of specialists in various fields such as gardens, forestry, architecture, furniture, pictures et cetera.

To help to pay for the upkeep of these gardens visitors have to pay an entrance fee, though entrance is free to members. The numbers grow, in general, yearly, with the consequent wear and tear on paths, grass verges and the like. Expensive lavatories and tea rooms have to be provided and as a consequence ever larger carparks have to be made. It is a vicious spiral but one with which all the staff cope bravely. When all is said and done it is upon the head gardeners and their staff that the maintenance and well-being of the gardens depend and it is good to record that they are all dedicated people.

The Trust's staff works with a dedication which is wholehearted and progressive, and during the last 30 years or so many gardens have been restored and refurbished. It is not always easy to know where to start in a derelict garden. Very few gardens in England remain as they were originally designed; superimposed on the original "bones" of the garden are the tastes and veering fashions of later generations. Sometimes it is not easily discernible what the original design was. Therefore it becomes necessary to delve deeply into archives, also to assess the appeal of what is on the ground, and to use a

Ham House, Richmond, Surrey (1670's), and a corner of the reconstructed parterre of the same period. Photo: B.O. Mulligan

Powis Castle, Powys, Wales. Early 18th century engraving of one of the most ambitious terraced Baroque gardens created in Britain. Courtesy of the National Trust



Perspective View of Powys Castle in the County of Montgomery.

wise tolerance in restoration. Sometimes a garden may have Elizabethan walls in one part, to which 17th century formality was added, while this may have been altered again in the 19th century, with perhaps another view from the house owing its beauty to the informality of the 18th century, through which some 20th century planting of trees and shrubs may be found. I have cited these possibilities because they do, in brief, indicate the successive trends through which gardens have progressed — or retrogressed — since 1600 or thereabouts. In spite of the numerous plants available today it is sometimes by no means easy to decide upon what sorts to plant in gardens which have a definite history. Plants come and go in fashion like garden design. But whereas garden design through the centuries until about 1800 was mainly the toy of the rich, swayed by fashion and economics, power and politics, the *craft* of gardening has remained uniform in its endeavour to produce superlative fruits, vegetables, herbs and flowers. Such was the desire until about 1650 from which date until about 1850 the craft of gardening was relegated to the ever greater walled gardens, which assumed such amplitude during the latter half of the Victorian era and until 1914. Today gardens in the main are smaller, but are richer in what they contain in plants than ever.

Probably the most ancient style of gardening was informal, with valued herbs, beautiful plants, fruit trees and bushes planted handily in the grassy surrounds of castle or monastery. Nothing remains to us of this except that throughout the centuries the "naturalising" of plants has never left us, and today's spreads of daffodils are a direct descendant of Francis Bacon's "wild heaths". All sorts of native and other plants grow naturally or naturalised in certain areas in informal parts of many of our gardens.

Walls and garden buildings remain to us from the late 16th century at Hardwick Hall, Derbyshire and Montacute, Somerset, though the planting is comparatively modern. The severe formality of the late 17th century was in great part due to Charles II's exile in Holland and France; but before his exile he had been defeated at the battle of Worcester and stayed a night, in flight, at Moseley Old Hall in Staffordshire. This little house came to the Trust in 1962,

Killerton, Devonshire. Cork oak in the extensive woodland garden. Photo: G.S. Thomas

and as no vestige of garden remained, except the surrounding wall, it was thought appropriate to lay out a parterre and arbour such as the King might have seen, taken from a design of 1640. It is a design of box-edged beds filled with different coloured gravels; only plants known to have been grown in 1651 are included elsewhere in the garden, including the Musk Rose of Shakespeare. A similar sort of difficulty was found in the absence of any definite garden at Little Moreton Hall, Cheshire; here a parterre design, taken from a book of 1670 has been laid out, mainly of gravel, grass and box edging. It is interesting to note that the dwarf box *(Buxus sempervirens* 'Suffruticosa') originated, like the yellow Dutch crocus, in Holland in the 16th century and has been the one and only dwarf type used ever since in formal gardens and kitchen gardens. At Packwood, Warwickshire, there is a garden bath of 1664 and a sundial dated 1667, but the celebrated yew garden, so often ascribed erroneously to the Commonwealth period, was not planted until the 19th century, though the mount and its row of yew sentinels are of the early 18th century.

At one of the Trust's most magnificent houses, Blickling Hall, Norfolk, we have a map showing a formal garden layout of 1729 which was adjusted in a later century to what we know today, while one of the most noted features of that time, the raised walk, is still extant as it is at Montacute. By means of raised walks and mounts the inmates were able to see what was going on in the then frightening countryside from the safety of the walled gardens. We have a very notable mount and moat at Dunham Massey, Cheshire, dating from the early 18th century. Even lakes and stew ponds, canals and

Ascott, Buckinghamshire. Formal garden designed by Veitch and Sons in 1874, at the edge of a large woodland garden. Photo: G.S. Thomas

ornamental ponds were all formal as may be seen at Castle Ward, Northern Ireland; Erddig, Clwyd; Dyrham Park, Gloucestershire and the renowned Dutch-style water garden at Westbury Court, Gloucestershire. This was derelict in 1967 but has been restored to much of its old style; fortunately the records of 1696-1705 made by its designer and owner had been preserved. The Trust owns many other properties where the original design is visible.

Fashions change slowly and it cannot be said that all formality disappeared by the beginning of the 18th century. It was a gradual evolution which caused the change, influenced by greater prosperity, travelling abroad and the growing awareness that nature could be beautiful and was therefore no longer frightening, coupled with the adoption of military-style ditches and fences to finalise the gardened area without preventing the eye from embracing the landscape. Thus the "haha" was born.[1] The transition of formality to informality can clearly be seen from successive old engravings of Claremont, Surrey, where Charles Bridgeman's formal pond was made informal by William Kent, and where "Capability" Brown added his touch also.

I think it may be said that by 1750 almost all great garden designs had become informal and the English Landscape Garden reigned supreme. I never cease to marvel at the change of taste which decreed formality and control "out" and informality and nature's hand "in", but this is what did happen, and during the two phases of garden design, all the precious plants were relegated to the kitchen garden, or garden proper. To many the Landscape Garden was not a garden at all; the Landscape from the very walls of the house sometimes extended in a limitless way and water was made to assume the serpentine line. A marvellous example is at Petworth Park, West Sussex. By the end of the century, with Humphrey Repton on the scene, the landscape was tamed, at least around the house, and some ideas took shape which led to gardens of modern design.

One of the prime examples of the Landscape Garden in England is Stourhead, Wiltshire, created from 1740 to 1780. Apart from the addition of exotic trees and shrubs — not envisaged by the designer Henry Hoare, but encouraged by his grandson — Stourhead stands as it was intended, a wonderful garden of successive pictures with classical overtones, composed of grass, water, trees and buildings. Not adulterated by later plantings in any way is Farnborough Hall in Oxfordshire; it is of the late 18th century. West Wycombe Park, Buckinghamshire, on the other hand, suffered a complete reversal of its entry-and-progress during its conception. At all three properties the classical and other buildings were designed specially for the places concerned, whereas Scotney Castle, Kent, serves as a splendid example of the Picturesque movement coming into full swing: the old castle was left and made good as an eye-catcher or Folly to be viewed from the new house built on the slopes of the higher garden.

In the mid-nineteenth century it must have been a relief for the garden staff to find that interest was once more to be orientated towards plants all over the garden, and not just in the walled gardens. Three factors contributed to this: a desire for more interest around the house, the arrival in ever increasing numbers of trees, shrubs and plants from all over the world, many hardy but many tender, and the understanding of cultivation in greenhouses, the direct descendants of the orangeries of the previous century. This brought about the use of tender bed-

[1]Elizabeth Rivers explains the "ha-ha" in her article "Aspects of Landscape Perception," *Arboretum Bulletin,* Vol. 43, No. 4 p. 34 (1980).

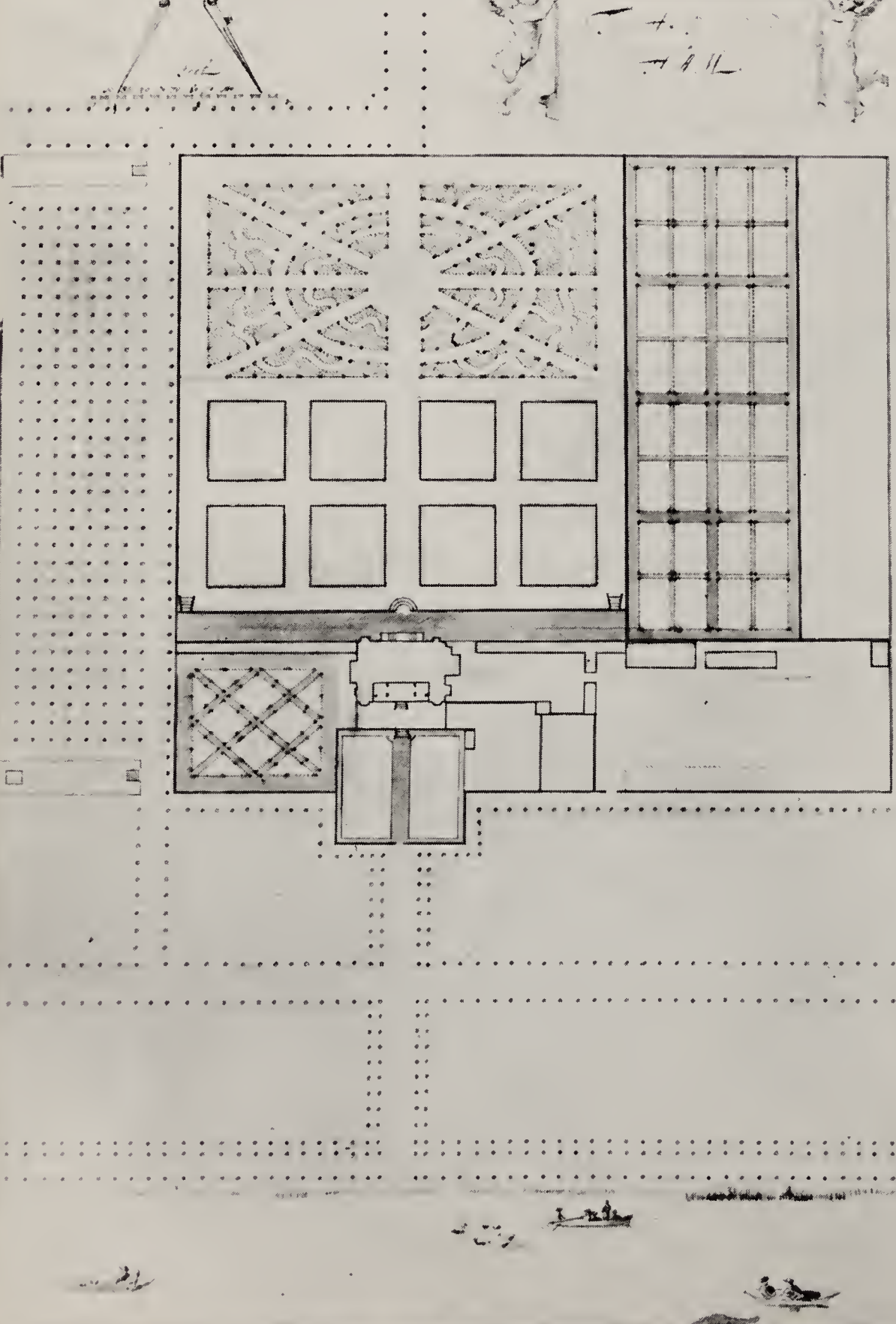
ding plants on the lawns, in designs often stemming from the parterres of earlier days. A remarkable example is the parterre at Oxburgh Hall, Norfolk, laid out in 1845 from a French design of over one hundred years earlier. This and the terraced beds at Lyme Park and Tatton Park, Cheshire, and at Ascott and Waddesdon, Buckinghamshire, are annually bedded-out in good style. Great conifers and rhododendrons provided excitement and competition between the big landowners; arboreta were started such as Killerton, Devon, from 1808, followed by many another celebrated "modern" garden such as Bodnant, Gwynedd; Nymans, West Sussex; Wakehurst, West Sussex, and Trengwainton, Cornwall, with the exotic tree and shrub plantings at Sheffield Park, East Sussex and Winkworth Arboretum, Surrey, bringing us right up to today.

This is but a cursory glance at the many styles of gardens to be found in these islands. I have only called attention to a few which most easily demonstrate my notes.

During all these hundreds of years garden owners, in their several generations, have added to or altered their gardens to an extraordinary degree. In England over the last hundred years or so the love of plants has been the desire before all else. In very few great gardens has

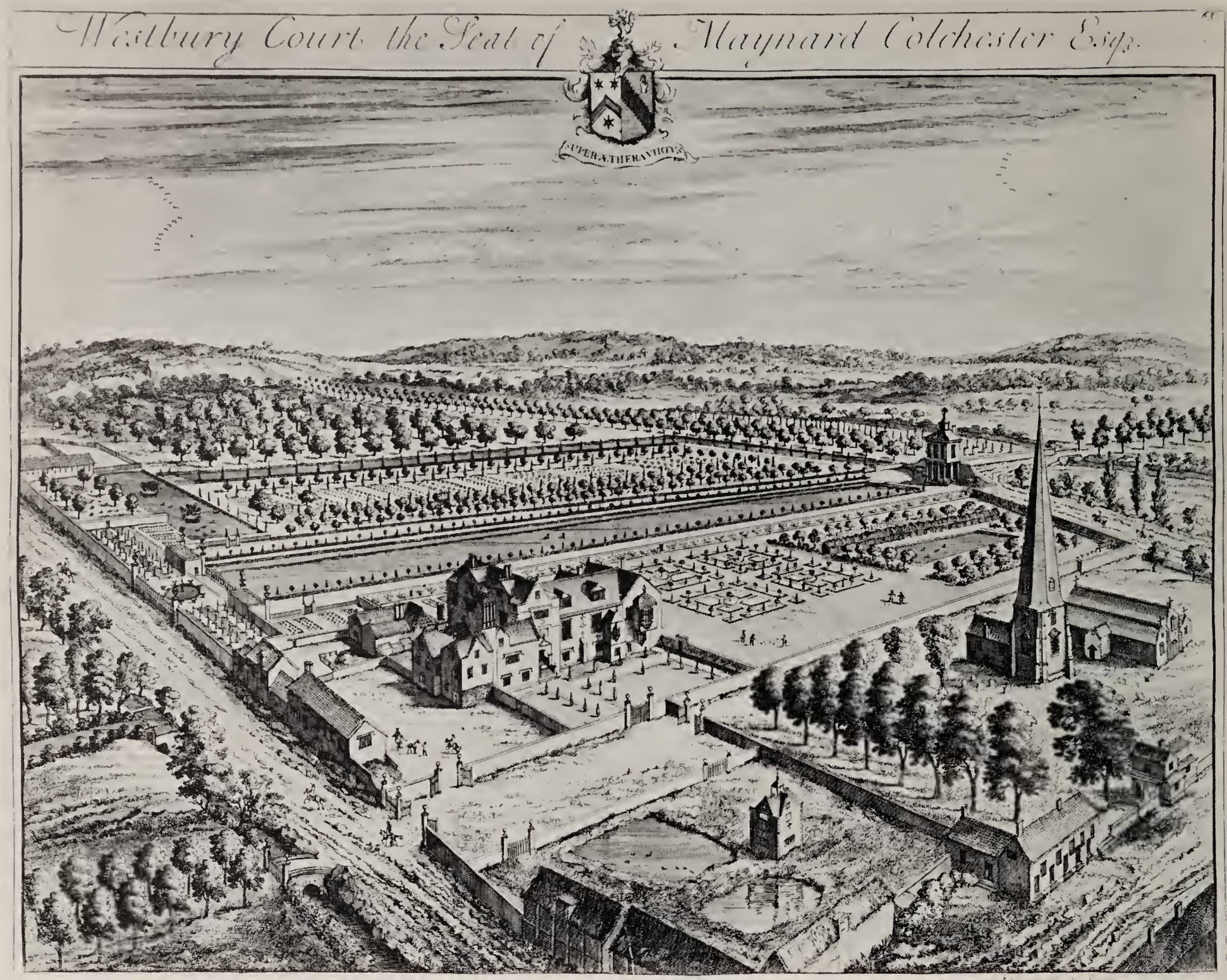
Polesden Lacey, Surrey. Early 20th century pergola in the rose garden of a great Edwardian hostess, The Hon. Mrs. Ronald Greville. **Photo: G.S. Thomas**

Stourhead, Wiltshire. Watercolour of the lake, by F. Nicholson, showing the temple of Apollo (on the left) and the Pantheon (on the right) in the landscape garden created by Henry Hoare. **Courtesy of the National Trust**



Clockwise from upper left: Sheffield Park, West Sus
and shrubs for autumn colour (The National Trust). I
(G.S. Thomas). Petworth House, West Sussex; the la
'Capability' Brown (S. Orme, The National Trust
Garden"; copper beech hedge defines a blue and
Surrey; the garden has been recently restored acc

: 18th century lake planted with conifers, and trees
ch-style box parterre at Ashdown House, Berkshire
7th century house in its setting created by Lancelot
dcote Manor, Gloucestershire; "Mrs. Winthrop's
ow planting scheme (G.S. Thomas). Ham House,
g to this plan of 1670 (The National Trust).



Westbury Court, Gloucestershire. Engraving by Johannes Kip (1717) showing the canals, garden pavilion, and church which still exist. The canals, pavilion and garden were recently restored. Courtesy of the National Trust

there been any obvious desire to keep things as they were, unless through lack of appreciation or cash. In most great places layer on layer of history is found, severe lines being reduced to sinuous ones, and then perhaps to wiggly ones; avenues of trees cut into and turned into clumps or felled altogether. Water was made into any shape, formal and informal, usually increased to sheets by the damming of streams. Latterly all the newer trees and shrubs, the magnolias, cherries, species of *Nothofagus* and *Metasequoia* are found taking the place of the Swamp Cypresses, Lawson's Cypresses and Redwoods, together with new hybrid trees and shrubs galore.

Earlier in this century there was the craze for the landscape rock garden and an example of a quarter-acre is at Sizergh Castle, Cumbria, but I think that what will probably be the most noted thing about 20th century gardens in England is the combined effect of William Robinson's predilection with the beauties of nature coupled with Gertrude Jekyll's artistry in welding all the new plants into gardens of good designs, with "rooms" for different colours, perhaps, as exemplified at Hidcote, Gloucester; Sissinghurst, Kent; and Tintinhull, Somerset.

Hidcote Manor, Gloucestershire. The principal vista in a garden created in the early 20th century by Major Laurence Johnston. Photo: G.S. Thomas

But there are many gardens in England which do not fit conveniently into any one pigeonhole. Let us look at a few. Take for example Anglesey Abbey, Cambridgeshire, with its varied vistas and lawns on flat land, punctuated by statuary, with avenues leading off into the countryside and flower gardens tucked away behind hedges. Compare this with mighty Bodnant where the

views take in Snowdon on clear days and it is over 200 feet from the top terrace to where the stream splashes below, dwarfing the height of the great conifers; there are formal terraces and informal valleys all welded into one, with a vast variety of plants. Little Bateman's in East Sussex has a rose garden laid out by Rudyard Kipling; Blickling Hall, Norfolk is complete with mile-long lake, formal radial avenues-and splendid displays of roses and herbaceous plants; the long formal water garden at Buscot Park, Oxfordshire, connecting the house with the lake was laid out by Harold Peto earlier in this century. Each has its noted attractions.

We might go to Castle Ward, Northern Ireland, where history overlaps from a mediaeval tower, a 17th century formal water and an 18th century temple to a garden and shrubs of the last century or so, and where the house is half Gothick and half classical because of the divergent ideas of husband and wife; to Clandon, Surrey, where a new parterre has been created near to the Maori hut and 18th century grotto; the historic terraces at Clevedon Court, Avon, of the planting of which Miss Jekyll disapproved; and the vast parterre at Cliveden, Buckinghamshire, of which William Robinson disapproved! (it was created over earlier schemes in 1851 and adds worthily

Anglesey Abbey, Cambridgeshire. Sculpture court created with columns from Chesterfield House, London, to commemorate the Coronation of Queen Elizabeth II.
Photo: G.S. Thomas

to the fascinating other historic portions of the garden — water garden, rose garden, herbaceous borders, Ilex grove, and topiary garden); Dunster Castle, Somerset, where a lemon plant has grown out of doors on a sunny wall for 150 years or more; Florence Court, Northern Ireland, with its huge Himalayan rhododendrons and weeping beeches, the home of the original Irish yew; Glendurgan, Cornwall, in whose almost frost-free valleys grow many tender exotic trees and shrubs and there is a laurel maze laid out in 1833.

Ham House, Surrey, is unique in that the house and all its contents are as they were in about 1672; fortunately we had records of the garden of that time and the whole design, which had become blurred and overgrown, has been

Claremont, Surrey. Painting of circa 1750 of the Amphitheatre designed by Charles Bridgeman and the lake designed by William Kent. This garden has been recently restored.
Courtesy of the National Trust

reinstated, complete with alleys and parterre. Just the opposite has happened at Knightshayes Court, Devon where the planting is in the modern genre, and Lanhydrock and Trelissick in Cornwall where the stress is on magnolias and rhododendrons, the former with its exquisite Elizabethan gate house and the latter where the ships in the estuary appear to be almost in the garden. Mottisfont Abbey, Hampshire, has claim to fame for many things; not the least are the river and the immense plane trees but also the Trust's collection of old French roses of the 19th century and all the ancestral species.

Besides Castle Ward, mentioned above, we have to go to Northern Ireland to see all the rare specimen trees and shrubs in the natural landscape at Rowallane, and the unique formal gardens at Mount Stewart. The latter are some of the finest in these islands, and, coupled with the lake and large plantings of trees and shrubs suitable for that mild climate, add up to a very impressive whole. Both gardens are of this century, as is most of Polesden Lacey, complete with its walled rose garden and herbaceous border, but there is also the formal walk extended to its present majestic length by Richard Brinsley Sheridan in the late 18th century.

I should have stopped you on the way up to Bodnant to show you the fine terraces at Powis Castle, Powys, probably created in about 1700 or soon after, with original topiary but modern planting, 80-year-old pyramid apples lining the walks of the old kitchen garden. At Sheffield Park, East Sussex, the autumn colour from dozens of Tupelo trees *(Nyssa sylvatica)*, and many other trees and shrubs from North America and the Far East are wonderful in October, grouped around its four large lakes and punctuated by dark conifers and Pampas Grass.

If it is rare and beautiful plants that you are looking for you will not be disappointed. At Bodnant alone nearly 50 rhododendrons have been raised, apart from other plants; Nymans is noted for Camellias, *Eucryphia* 'Nymansay', magnolias, rhododendrons and other plants; Hidcote — but there are many plants christened 'Hidcote' or 'Lawrence Johnston'; Trengwainton, Wakehurst and Rowallane have also contributed much to rhododendrons and other plants. You will find a large collection of hydrangeas at Trelissick; *Sorbus* and *Acer* at Winkworth; conifers

Bodnant, Gwynedd, Wales. *Abies procera* and other conifers in the Dell of a large garden created during the last 100 years. Photo: G.S. Thomas

at Wakehurst, tender shrubs and plants at Trengwainton; a Japanese garden with Japanese plants at Tatton Park; hardy ferns and dwarf conifers at Sizergh Castle; herbs medicinal and culinary in several gardens but particularly at Acorn Bank, Cumbria, and Hardwick Hall, and great trees everywhere.

The gardens tended by the National Trust can justly be claimed as the greatest collection of gardens ever owned by one organisation. Some are open daily, others at advertised times, and in spite of the wear and tear your visit will be welcomed. Further particulars of opening times, membership etc., can be obtained from The National Trust, 42, Queen Anne's Gate, London, S.W.1. England.

The National Trust for Scotland is a separate though similar concern and also has great houses, gardens and large stretches of countryside to look after; its address is 5, Charlotte Square, Edinburgh.

A Native Garden In the City

*GENIE STEWART**

The first time I saw a northwest woods, I felt I was in an enchanted place. Sword ferns covered the forest floor with the repeating patterns of their fronds. Oregon oxalis and wild lily-of-the-valley, growing about the trunks of trees, created a scene from a fairytale book. However, it did not occur to me to try growing these wild plants until I had been gardening for several years.

When we moved into our fifty-year-old house in northeast Seattle, the yard was neglected. Neighbors remembered that it had been beautiful before illness prevented the previous owners from tending it. We were forced to remove some overgrown plants: four cedars that had completely overshadowed several windows, and a mound of ivy covering an entire conifer stump. There was also an eighty foot Douglas fir which cast a considerable amount of shade, but cutting it down was out of the question for a pair of midwesterners who had never had such a large evergreen in a garden. It was too magnificent. Nature had taken too much time growing it for us to consider anything but keeping it as it was.

Despite the shade, I tried maintaining the many rose bushes that were in the yard, but it seemed that I would have to spray and fertilize them constantly to battle the aphids and powdery mildew. I also tried growing snapdragons, cosmos, and zinnias which I remembered from my mother's garden, but they never matured in the shaded yard before our Seattle summer was over. The same was true of a vegetable garden, which produced very little for all the effort that went into it.

My growing concern for the environment and an interest in forest ecology gave me the idea to try returning my city yard to something like the woodland it had been in the past. After all, if nature managed to keep western Washington one of the most beautiful green places on earth, shady areas could be an asset!

We first removed the rose bushes, and I started to buy both native and non-native plants that were reputed to grow well in shade. Most of these came from the Arboretum spring plant and fall bulb sales. Some were from nurseries, and others from friends who live closer to woodlands than I. I also obtained a permit and unearthed a few special plants on forest lands. For information about proper culture of the plants, I used *Wild Flowers of Mount Rainier and the Cascades,* by Mary Fries, which provided excellent descriptions of each plant's habitat. *Growing Wildflowers,* by Marie Sperka, and *Wild Shrubs,* by Joy Spurr, were also very helpful.

I have enjoyed varying success with my transplants. Bunchberry, vanilla leaf, twin flower, wild ginger, and huckleberry have flourished in my garden, while my violets never live more than one year. Slugs that never touch my ginger gobble up *Hepatica* in a single day.

Our venerable Douglas fir dominates my new native landscape. The dry and shady area close to its trunk is a difficult spot to fill. However, bunchberry *(Cornus canadensis)* will survive there although it does not grow in abundance. The *Cornus* prefers a location farther from the tree, where it receives light off and on throughout the day as the sun passes over the tree branches. This patch of *Cornus* also enjoys a good mulch of leaves from the small pin oak nearby. The *Cornus* started as half a flat five years ago, and is now a patch three feet in diameter and extending onto our brick patio. It starts flowering early in May and continues to mid-July, but as yet has produced only a few berries. I also have *Cornus* in my rockery where it receives hot western sun part of the day. There it tunnels under rocks and pops up in surprising places. The leaves and flowers are larger and less compact than those of the shaded plants.

Vanilla leaf *(Achlys triphylla)* came in with another plant several years ago and until last year had only a few leaves. It is now very thick under the Douglas fir, and appears to be another hardy plant for that location.

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*Genie Stewart has been experimenting with the cultivation of native plants in Seattle for six years. She is a member of the Washington Native Plant Society, and is interested in weaving and natural dyeing.

Twin flower *(Linnaea borealis)* reportedly difficult to grow, is taking over my yard. It is growing so well that it has started up the trunk of the fir. In the rockery, where it gets quite a lot of sun, its leaves turn reddish. The largest patch of *Linnaea* that I have is in a cedar container on the east side of the house where it is shaded in the late afternoon. There it has spread over the soil, down the sides of the container, and is rooting in the garden soil below. Its small delicate flowers more than compensate for their size with their delightful fragrance.

Wild ginger *(Asarum caudatum)* is growing in semi-shade on the east side of the house near the water faucet where it gets plenty of moisture, and also on the south side of the fir in what is probably the sunniest part of my yard. Its leaves sometimes get burned on the warmest summer days, yet it continues to spread by underground shoots and propagates better than in the shadier location.

My favorite shrubs are the huckleberries, which provide both decoration and edible berries. Several red huckleberries (Vaccinium parvifolium) are planted on the east side of the house. They have been there for about two years and are healthy, but have produced only a few berries. In the sunny rockery live large evergreen huckleberries *(Vaccinium ovatum)* with attractive copper and green foliage and quantities of berries.

Plants from underground bulbs and stems also make successful transplants. *Iris douglasiana* is planted along my front sidewalk at the bottom of the rockery, an ideal spot for it. The flowers burst open on the first warm days in May, and for about two weeks they delight passersby with lavender-blue color.

I have several *Trillium ovatum* scattered around the yard and none seems to be bothered by slugs. *Camassia quamash, Erythronium oregonum, Trientalis latifolia, Dodecatheon meadia, D. hendersonii, Fritillaria lanceolata,* and *Lilium columbianum* are some of the many bulbs that come up at various times during the spring and summer. Eastern United States natives also do well. A patch of yellow lady's slipper *(Cypripedium calceolus var. pubescens)* near the pin oak increases the number of flowers it bears each year. *Cypripedium reginae (spectabile),* a pink lady's slipper, was planted two years ago and has grown larger, but has not yet bloomed.

***Linnaea borealis,* twinflower, grows in the deep shade beneath *a* Douglas fir. Photo: D.M. Metheny**

Many wild plants seem to need a few years to adjust to their new surroundings.

Sometime in the future when the soil in my garden has reached a more woodland condition, I would like to try growing other difficult plants such as pipsissewa *(Chimaphila umbellata)* and *Calypso bulbosa.* These, however, are endangered species.

There are several species of native ferns in my garden. Many sword ferns *(Polystichum munitum)* are used around the yard for filling empty spaces in both sun and shade. They enabled the rock garden to look established after only one year. Since they are evergreen, they add interest

to any part of the garden year-round, but sometimes they can be difficult to remove. *Polystichum andersonii,* also evergreen but lacier and lighter in color, has the added advantage of forming tiny new ferns on the ends of its fronds. I now have several, all started from one plant. Oak fern *(Gymnocarpium dryopteris)* is racing with the *Linnaea* to take over my yard. *Polypodium glycyrrhiza (vulgare),* the licorice fern, has been surviving near the water faucet for several years and only recently has started to spread.

Even some plants that we think of as "invasive" can form beautiful carpets of green. In my garden the heart-shaped leaves of wild ginger and of *Maianthemum dilatatum (unifolium),* wild lily-of-the-valley, have intermingled with shamrock-like *Oxalis* to create a delightful woodsy effect. They are overswayed by the lacy fronds of a nearby maidenhair fern, *Adiantum pedatum.*

Except for a time in the spring when the flowers all seem to bloom at once, the native shade garden is not a garden of striking color. Most of the beauty is in the refreshing shades of green and the patterns created by the variously shaped leaves. However, there are more possibilities for color in the sun of the rockery: *Iris,* lilies, and *Sysyrinchium,* among others.

All this success has not been achieved without work. The soil in my yard is almost pure sand a few inches below the surface. This provides excellent drainage, but also means I must add large amounts of organic material such as ground bark, steer manure, and compost. The amounts of each depend upon what I have available. I try to achieve a soil mixture of about 2/3 indigenous sand and 1/3 organic material. Leaves from sweetgum, hawthorn, cherry and tulip trees, ponderosa pine needles, and Douglas fir needles and cones all contribute to the compost. I obtain these from my own trees and from nearby gardens. One might think that all the bark and partially composted leaves would rob too much nitrogen from the plants, but it seems to provide just the soil in which woodland plants thrive.

I water often during the summer — every other day during the driest months but then less toward the end of August — to allow the plants to harden off for winter. The results have been tremendous, everything has grown much faster and lusher. Frequent watering does not seem to have produced shallow roots. I can water heavily for a few days and leave on trips for as long as three weeks without losing a single plant. I usually water by hand with the hose nozzle set to mist. This way I can get all corners of my yard and water the foliage as well.[1]

When I first started gardening, I was plagued with powdery mildew, and tried watering early in the day so the foliage could dry off in the sun. That is what anything I read on the subject instructed me to do. The result was more mildew, even turning my grass white. Now I water in the evening after the yard is in shade, as nature does in the form of dew. I have also eliminated the more susceptible plants from the garden: lupine, phlox, sunflower, zucchini. As a result of these two practices, I have practically eliminated powdery mildew from my garden.

I have dealt with slugs and insects by eliminating the most susceptible plants and by learning to tolerate a few less-than-perfect leaves. At first I set out traps with beer for slugs. The traps were ugly and attracted additional slugs (and neighborhood dogs) to my garden. I finally gave up my marigolds — the only plant the slugs were eating. Now I just throw the slugs away with the weeds when I find them. Aphids are no longer a problem now that we have removed the roses. I do get some on the early spring growth of *Campanula,* but eliminate them by pinching off the infested plant parts and reap the benefit of later and thicker bloom. Sometimes blasting the aphids off with a jet of water will keep them away until the plants mature and are less susceptible. My only difficult pest problem has been the root weevils, especially on the huckleberries. I have minimized their numbers by going out at night with a flashlight and knocking them off into a can of soapy water. I have also poured Lysol and water on the ground to kill the larvae, but repeated applications would probably destroy the beneficial microorganisms in the soil. Importing toads to my yard would probably be the best way to tackle weevils, but neighborhood predators might prove fatal to the toads.

There are many more native species in my garden which I have not mentioned. Since light, soil type, and moisture all vary from one yard to the next, each one of us has to discover what plants and what practices are suitable. Other

[1]Tukey, H.B., Jr. Summer 1980. Effect of rain and mist on plant growth. U.W. *Arboretum Bulletin* 43 (2): 2-4.

gardens would result in swamps if they were watered as much as mine. Gardening with nature does take patience; waiting for the humus to build enough to support a demanding plant, or waiting for that special plant to become available. Natural gardening also requires a willingness to give up on those species which are not suited to ones yard, and to prize those which are.

A whole world of plants would have been lost to me if I had cut down my Douglas fir in order to create a sunny midwest garden.

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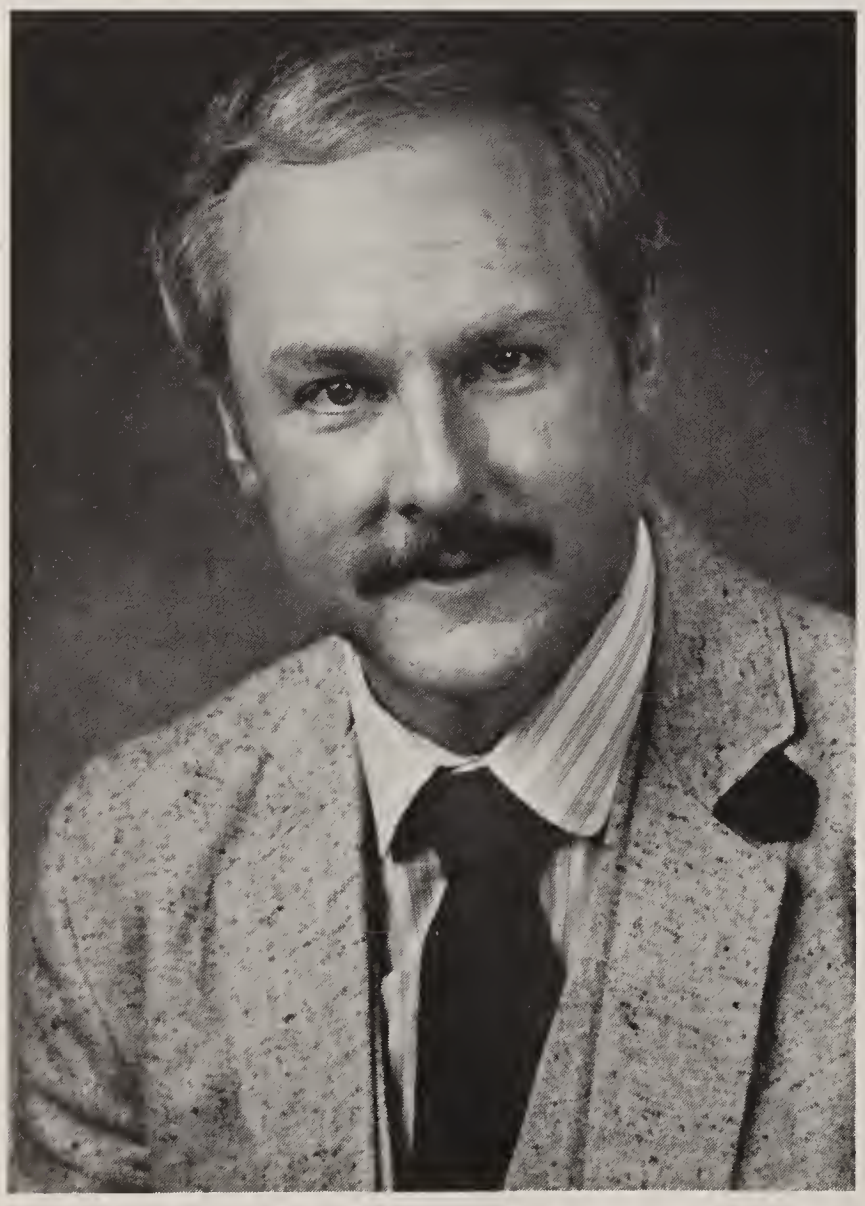
John Wott Joins the Center for Urban Horticulture

Welcome to Dr. John A. Wott, the newest faculty member in the Center for Urban Horticulture at the University of Washington. He will be responsible for the continuing education and public service programs of the Center, will conduct research on the educational aspects of horticulture, and will advise graduate students.

Dr. Wott was Professor of Horticulture at Purdue University for 12 years. While living in Indiana, he developed a home horticulture program which became a model for extension activities in other states. He has authored many informational brochures and pamphlets, has produced radio and television tapes, and together with his students has designed and constructed educational exhibits at state and local horticulture fairs.



John Wott, a native of Ohio, graduated with honors from Ohio State University in Agricultural Education, and then spent more than 3 years as a county extension specialist. He later received his MS and PhD degrees from Cornell University, where he investigated the use of intermittent nutrient mist in the propagation of cuttings. He is currently President of the Eastern Region of the International Plant Propagators Society, is a member of the Board of Directors of the American Horticultural Society, and heads the Education Committee for that organization.

Dr. Wott and his wife, June, have 3 children: Chris, a senior in radio communications at Purdue; Tim, who will enter the University of Washington in engineering; and Holly, who attends sixth grade.

Dr. Wott brings excellence in programming and leadership to the Center, and we are pleased to have him and his family as part of horticulture in the Pacific Northwest.

H.B. TUKEY

Rhododendron yakushimanum **in full bloom, the pride of Pukeiti.** **Photo: E.B. Dunn**

Pukeiti—Horticultural Jewel

*EDWARD B. DUNN**

Now that the Boeing 747 makes a twelve-hour flight from Los Angeles to Auckland, New Zealand, it is possible to make an almost immediate exchange of seasons — Autumn for Spring. An increasing number of North Americans are discovering another world of interest, beauty and sun in the Antipodes. A recent fine article by Jan Pirzio-Biroli (*U.W. Arboretum Bulletin,* Winter 1980, Volume 43, No. 4, p. 19) describes part of the New Zealand tour made last Fall, sponsored by the University of Washington Arboretum. Most of the tour members returned with glowing reports of the lovely land, its hospitable people and its wealth of horticulture.

I did not take that trip but I did travel the year before in November, making an automobile tour of the two islands, and fell in love with both. For me, the most fascinating experience was the two days I spent strolling around the magnificent garden of the Pukeiti Rhododendron Trust near New Plymouth on the west coast of the North Island.

Pukeiti (Maori for "little hill") consists of a nine-hundred-acre tract nestled between snow-capped Mount Egmont *(Taranaki)* and the west coast. In 1951, when the idea of a garden was conceived, it was covered only with native bush and the remnants of clear cutting. The soil is a deep, yellow, volcanic loam with centuries of accumulation of forest mold, slightly acid and having good drainage. Most of the old trees had been logged and the surviving dense brush presented a colossal job of clearing in order to expose the good native plants.

*Edward B. Dunn has been associated with the University of Washington Arboretum Foundation for many years, and was president of the Foundation when the Japanese Tea Garden was originally built. He is interested in rhododendrons, and is a former president of the American Rhododendron Society.

The rhododendron plantings and lawn in front of the curator's house at Pukeiti. Photo: J. Pirzio-Biroli

In 1951 a group of enthusiastic gardeners had a vision of building a natural garden of native and exotic trees, shrubs and plants, with an emphasis on rhododendrons. This handful of 35 determined people, among whom were Russell Matthews and Douglas Cook, organized a private trust, the Pukeiti Rhododendron Trust. Without help other than donations of time, labor and funds from members, they proceeded to create what I consider to be the greatest rhododendron garden in the world.

Frank Kingdon-Ward once noted that New Zealand had no native rhododendrons. His vivid description of Asia "where the genus *Rhododendron* finds its spiritual home and breaks out in a war dance of variation" is most apt for Pukeiti.

A frustration to any gardener, of course, is the fact that he or she cannot be everywhere at once. This garden is rich and varied in plants and blossoms all year, but visitors from far away can enjoy only a small portion of its beauty. My two days were spent in the middle of November, at the height of bloom for the *Rhododendron* hybrids but a little late for the species, especially the large-leaved ones. My only complaint was that I could not have come earlier and stayed longer.

Graham Smith, a most hospitable and knowledgeable curator, gave me a tour of the *Rhododendron* area which is laid out in blocks according to series. These blocks are easily viewed from named walks or "tracks". He led me first to the Hybrid Block featuring many well-known favorites: *Rhododendron* 'Britannia', 'Mrs. Furnival', 'Van Nes Sensation' and numerous tremendous 'Loderi' forms. Nearby, the Stead Block comprises an interesting collection of hybrids from the Ilam garden in Christchurch. Most noteworthy are hybrids with *R. griersonianum* blood, garden plants which are quite superior to the species. Also, there are many *R.* 'Loderi' in this area which show much greater annual growth and blossom than we get in our Arboretum.

As we turned and retraced our steps down to the Aykbourne Walk I got my first good view of the focal point of Pukeiti — The Giant *Rata* — which rises above all other trees in the western end. It stands — a gaunt skeleton draped with epiphytic plants — as a lesson in natural survival. It started life probably over a thousand years ago as a seedling *Metrosideros robusta* high in the branches of a *Rimu* tree *(Dacrydium cupressinum),* and gradually over the years, extended its vine-like roots down to earth, encompassing and killing the host. These roots appear as a solid trunk but one can discern through them the hollow trunk of the decayed *Rimu.*

Fine examples of *Rhododendron elliottii* line this walk along with many familiar hybrids of excellent health. A little farther on we came to the famous Nuttallii Valley. This draw leads to the north away from the walk and though almost hidden by small shrubs and ferns, affords a good view to the summit of Little Hill. Here are wonderful plants of the tender *R. nuttallii,* voluptuous in creamy white trumpets and gorgeous heavy foliage. Even though some of the blossoms had fallen, there were still plenty, and it was a thrill to see such a wealth of the largest blooms to be found in the genus.

Leaving the valley we proceeded along the Species Walk, passing numerous specimens of *Rhododendron arboreum,* happy under a canopy of native trees and tree ferns. *Rhododendron macabeanum* and *R. simsii* were past blooming but were impressive in size. It was fascinating to see so many of the Maddenii Series growing well in this kind of climate. A feature of this walk is a profusion of *R. lindleyi.* Both the Ludlow and Sherriff and the Kingdon-Ward forms were blooming and filling the air with their exotic fragrance. From here we moved on past the Giant *Rata* to the Valley of the Giants.

I was greatly taken by this valley so rightly named. It contains a magnificent collection of the large-leaved rhododendrons which must be the finest anywhere. *Rhododendron griffithianum, R. falconeri, R. grande, R. sino-grande, R. fictolacteum* and *R. mollyanum* are so large I could see the remnants of bloom only by looking up from the forest floor. I cannot believe that

***Rhododendron nuttallii*, close view of flowers and foliage.** **Photo: J. Pirzio-Biroli**

these huge trees could be happier, even in their native Asia. Most impressive! How I wished I could have seen at least some of the giants in their prime of bloom in October.

A lovely stream winds through this glade which is brightened by masses of *Primula,* mostly *P. helodoxa* and *P. japonica,* when I was there. *Primula smithiana* and *P. bulleyana* were also in evidence. Drifts of these are interspersed with hostas and ferns. Native trees dripping with vines and epiphytic plants make this a jungle, but an orderly one, that seems to be the ideal environment for moisture-loving shrubs. Almost unbelievably beautiful!

While the emphasis in Pukeiti is on rhododendrons there is no shortage of companion plants or of native material. All through the area but particularly in the bush there are fine examples of *Weinmannia racemosa* (which forms much of the canopy), *Dacrydium kirkii* (a podocarp noted for its large needle-like leaves) and many others including the native cabbage tree, *Cordyline banksii. Libocedrus plumosa* and *L. bidwilli* are New Zealand mountain natives. *Nothofagus solandri* and *N. truncata,* mountain and lowland beeches respectively, are numerous. The list of natives is very long.

Many exotics have been introduced to New Zealand; most do better here than in their native soil. *Cryptomeria japonica* and *Thuja plicata* are growing rapidly in the Hybrid Block. Our Douglas fir is very fast-growing near the nursery, and a beautiful specimen of *Tsuga heterophylla* is considered the most graceful conifer in the garden.

Magnolias, camellias, cherries and maples are used extensively as companion plants with azaleas and the smaller rhododendrons. *Camellia reticulata* and its hybrids are numerous but *C. japonica* and *C. sasanqua* are missing because the rainfall is too great. There are excellent specimens of *Magnolia campbellii* and its various forms. *Magnolia kobus* and *M. stellata* are well represented as is *M. sargentiana* var. *robusta.* But *M.* x *soulangiana* has difficulty in surviving the predation of Pukeiti's worst pest — the opossum. The near relative of *Magnolia, Michelia doltsopa,* forms huge trunks that contrast with the many tree ferns against the skyline. None of the magnolias were in bloom at the time of my visit, but, like the huge stalks of *Lilium auratum* and *Cardocrinum giganteum,* bore witness to glories past and to come.

I was not surprised to see deciduous azaleas growing well in the open but did not expect to find hostas in the same unshaded bed. I think one reason that the plants bloom so well is that there is never an extended period of full sun, even in the open areas. Rhododendrons that cannot stand exposure in Seattle are happy in Pukeiti — they receive sufficient sunlight to produce blossoms but are never over-cooked.

Malesian rhododendrons are well represented in a cool house, and the collection of bright colors was increasing.

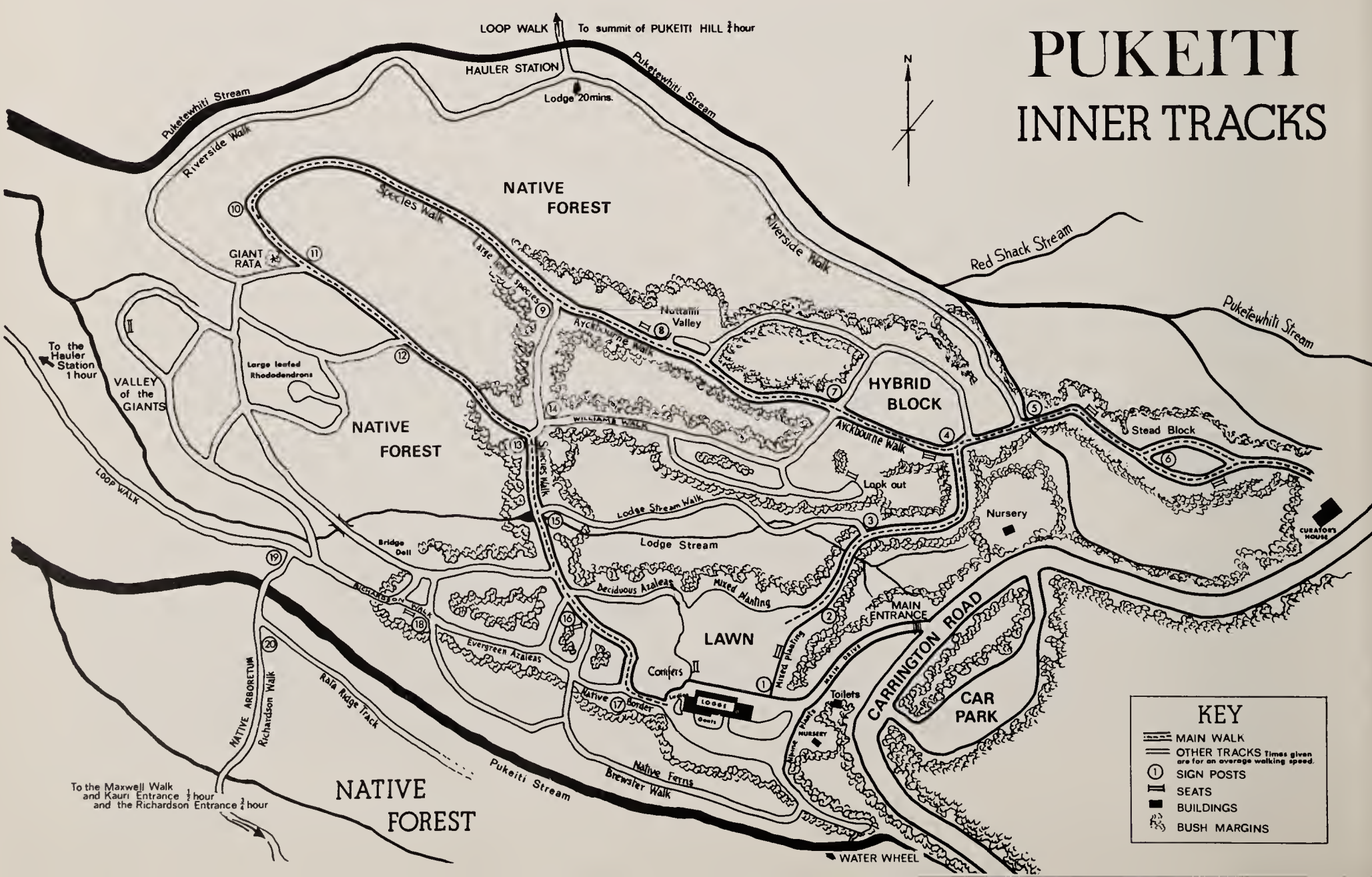
Graham led me back toward the Lodge after a good look at the vireyas in the Display House and introduced me to his pride and joy, the perfect rhododendron: a colossal specimen of *Rhododendron yakushimanum.* Nearly in full bloom,

four feet tall and twice as wide, it must be the largest "yak" in existence. For one who considers this species the perfect rhododendron it was a great experience to see it in such size and perfect condition. The Exbury form, it could not be faulted in any way for a "best in show". Except for the Valley of the Giants this plant was the jewel of Pukeiti — the climax to a wonderful two-day visit.

Aside from the wealth and variety of material I was most impressed by the rate of growth in this part of New Zealand. Conditions seem to be nearly perfect. Pukeiti lies just south of latitude 39° south and west of longitude 174° east, and the mean temperature is about that of San Francisco, but the warm wind from the Tasman Sea drops about 150 inches of rain each year. This is even more than our own Pacific Northwest rain forest — so wear your raingear and rubbers. Pukeiti is rightly called "a green land of soft air and many streams".

I certainly hope to return for another visit to this delightful "down-under" land and to spend more time at Pukeiti. I hope that other horticulturally-minded people will make the trip to witness the wonders that can be accomplished when a dedicated, energetic group of people decide to turn a piece of stumpland into a place of lasting beauty.

The Giant *Rata, Metrosideros robusta,* now draped with epiphytic plants, started life itself as an epiphyte.
Photo: J. Pirzio-Biroli



Arboretum Notes and News

The irrigation system, replacing the decaying waterlines originally placed in the late 1930's, has been completed and is now ready for operation if and when the rain stops. Concurrently the area sometimes known as the "pit" or "pea patch"—that parcel of land between the Pinetum and the ramps to Highway 520 at the north entrance to the Arboretum—has been filled and contoured. It was seeded to grass in mid-May and will be planted to conifers during the fall and winter months.

The Tea House in the Japanese Garden, which has been rebuilt during the past six months, was dedicated on May 16th and turned over to the City of Seattle at that time. Further information on its reconstruction and future, along with that of the Japanese Garden, will appear in forthcoming issues.

J.A.W.

Arboretum Guide Program

YOU ARE INVITED TO BE AN ARBORETUM GUIDE. The rewards are: a better knowledge of your Arboretum, the satisfaction of taking part in a valuable public service, and fellowship — with other guides and with your guests in the Arboretum.

A GENERAL ORIENTATION SESSION will be held on Tuesday, September 15 at 10 AM for new and returning guides. Meet in the Arboretum Greenhouse. Intensive training sessions for General Arboretum and Native Guides will begin after the first of the year.

In the meantime all guides are urged to attend the public programs on PLANTS IN THE ARBORETUM, followed by optional tours in the Arboretum. No admission charge. Meet at 10 AM at the Montlake Community Center on the following dates:

September 30: Berries and Fruits for Fall Color, by J.A. Witt, Curator of Plant Collections

October 21: Fall Foliage Color, by Brian O. Mulligan, Director Emeritus of the Arboretum

In November: Hollies in the Arboretum, by Virginia Morell, American Holly Society

For further information, call Jan Pirzio-Biroli, Volunteer Coordinator in the Arboretum, 543-8800.

Classes of Interest

University of Washington Continuing Education

For complete details on these and other courses call (206) 543-2590 weekdays and ask for SPECTRUM, free journal of Continuing Education.

ELLIOTT BAY: YOUR WATERFRONT. This lecture series will explore the richness and variety of Elliott Bay—selected aspects of the waterfront's history, uses and future trends. A boat trip and a walking tour of the waterfront are included. Lecturers include Professor Marc Hershman of the UW Institute for Marine Studies; Murray Morgan and David Buerge, noted historians and authors; J.J. Dillon and Roland Carey, maritime historians; and Captain Bob Matson, executive secretary, Washington Ferry Retirees. Tuesdays, June 30-August 18; 7-9:30 PM; 8 sessions; $33 (includes boat trip).

SEASHORE LIFE of PUGET SOUND. Professor Eugene Kozloff, noted zoologist and author, will combine a morning lecture on campus with an afternoon bus trip to a Puget Sound shore. He has planned this Saturday program for those who wish a concise introduction to some of the more obvious seashore plants and animals of Puget Sound. Early registration advised. Saturday, June 20, 9:30 AM-4:30 PM, bus transportation included, $29.

NORTHWEST BEACHES AND BLUFFS. You will acquire the skills of observation necessary to study the physical processes shaping the coastline—what to look for, where to look, and how to interpret what you are seeing when you are at the beach or on a bluff. Andrew Ruotsala, instructor, is the author of "A Beach Processes Field Guide for the Pacific Northwest". The concluding session will be at the beach at low tide. Tuesday and Thursday, July 14 and 16, 7-10 PM; Saturday, July 18, noon-3 PM; 3 sessions, $29.

GROWING ORCHIDS. Diane Varney, botanist and instructor of this one-day workshop, will take students into the beautiful world of orchids. The culture of orchids both in the greenhouse and in the home will be explored as well as the diversity, hybridization, propagation and pollination. There will also be a greenhouse tour. Saturday, July 11, 9 AM-4 PM; $24.

OLYMPIC MOUNTAINS PLANT LIFE: SEA LEVEL TO TIMBERLINE. An interesting leisurely weekend spent in Port Angeles and the Olympic Mountains studying plants of the forests and meadows and mountains. Accommodations are at Peninsula College. Botanists Richard Fonda and Patricia Milliren have chosen this particular time because it is the peak of the alpine flower season. Transportation provided for all field trips but you must provide your own transportation to Port Angeles. Friday 8 PM through Sunday lunch, July 24-26. Fee of $98 includes instruction, overnight lodging (double occupancy) Friday and Saturday; breakfast, lunch and dinner Saturday; lunch Sunday.

CASCADE VOLCANOES UP CLOSE: CRATER LAKE AND BACK. Mount St. Helens and Crater Lake (Mount Mazama) are only two of 18 major volcanoes making up the Cascade Range that stretches from southern British Columbia to northern California. On this four-day field trip you will examine the variation of volcanic features from southern Washington to southern Oregon with volcanologist Anthony J. (Tony) Irving and plant ecologist Virginia Dale, both actively engaged in the research of Mount St. Helens and other Cascade volcanoes. Detailed visits will be made to Lava Butte, Newberry Caldera, Crater Lake and Mount St. Helens area. At Crater Lake, there will be an optional boat trip to Wizard Island, a younger cinder cone. Tuesday, July 28, 7:30-9:30 PM lecture; Friday, July 31, 8 AM through Monday, August 3, 5 PM, trip. Fee of $148 includes tuition, transportation, accommodations (double occupancy), sack lunch Friday, breakfast and sack lunch Monday. Limited enrollment.

BIRDING ON MOUNT RAINIER. This weekender will focus on the many species of birds of the forest. Aspects of natural history will be pointed out and discussed during walks through several habitats. There will be lecture/slide presentations, field observation of the birds of this area as well as ecological discussion. Dr. Dennis Paulson, zoologist, is the instructor. Participants will reside at The Lodge near Ashford at the base of Mount Rainier. Meals will be at Alexander's Manor, a restored country inn and gourmet's delight. Friday evening 5 PM through Sunday early afternoon, June 12-14. Fee of $98 includes transportation to and from Seattle, dorm-style lodging Friday and Saturday night, and five meals.

PLANT ECOLOGY OF GLACIER PEAK: A CAMPING WEEKEND. This is for the rugged—the course will entail hiking in to a base camp (approximately five miles) with your pack on your back. Glacier Peak (a spectacular old volcano) in the North Cascades is not heavily visited and has a wide diversity of wildflowers, trees and other plants to be viewed while you learn their names, succession, evolution and general ecology. Bring your own camping equipment. Instructors are Virginia Dale Adams, plant ecologist, and A.B. Adams, botanist. Wednesday, August 5, 7-9 PM, pretrip lecture/slide presentation; Friday, August 7, 1 PM through Sunday, August 9, 4 PM. Fee of $98 includes instruction, transportation to and from Glacier Peak Wilderness Area, 6 meals.

WILDFLOWERS ON MOUNT RAINIER. If you like to hike and want to gain a better understanding of the beautiful area which surrounds you, this field course is for you. In a Friday evening lecture with slides, a day hike on Saturday, and a morning walk on Sunday, you will learn about the plant ecology of Mount Rainier's subalpine meadows and forests and the Kautz mudflow. This weekender is set for the peak of the alpine blooming season. Virginia Dale Adams, plant ecologist, and A.B. Adams, botanist, are instructors. You will stay at The Lodge near Ashford at the base of Mount Rainier and you will dine at nearby Alexander's Manor. Friday 8 PM to Sunday noon, August 14-16. Fee of $98 covers tuition, dormitory style lodging, 4 meals. Transportation provided from The Lodge to trailheads.

University of Washington Burke Museum

DRAGONFLIES. The 4-week course will deal with the general biology of dragonflies, including life history, feeding, larval and adult ecology, reproduction and identification of Northwest species. Lectures will be illustrated with slides and specimens. Instructor: Dr. Dennis Paulson, a world-renowned expert on dragonflies. One half-day field trip near Seattle and one all-day field trip to eastern Washington will be arranged during the course, dependent on good weather. Transportation will be by carpooling, cost shared by students. Classes will be held on Wednesday evenings, 7 to 9 PM, from July 1 to 22. Cost for the course is $20. Enrollment limited to 25 people. Call 543-5592 to register.

BIRDS OF WASHINGTON. The 12-week course will stress field identification, habits and occurrence of all common birds of the state with slide-illustrated lectures once a week. Instructor: Dr. Dennis Paulson. Four all-day and one half-day field trips will be conducted to a variety of habitats and regions. Classes will be held on Wednesday evenings, 7 to 9 PM, from July 29 through October 21 (except August 19). Field trips can be taken either Saturday or Sunday. Cost for the course is yet to be determined, but will be approximately $80 (includes transportation). This course fills quickly—if interested you should call 543-5592 as soon as possible, to register and for more information. (A "lectures only" option is also available. The cost for this is approximately $40.)

Pacific Science Center School for Science

PLANNING FOR PEOPLE: SPACES, PLANTS AND PLACES. This class will incorporate all factors and materials that influence landscape design, particularly on the residential scale. Students will be encouraged to prepare conceptual plans for their own gardens. Instructor: Glen Hunt. Class will be held June 30, July 7, 12, 14, 21, 28, and August 4 and 11 from 7:00-10:00 PM. Tuition is $87.50 ($77.50 for members of the Pacific Science Center).

PLANT USE AND IDENTIFICATION. This course will include a study of trees, shrubs, groundcovers and certain perennials by their uses in the landscape according to botanical characteristics. On these field trips Mr. Glen Hunt will discuss where plants are placed in order to give design unity, privacy, and climate and erosion control. Dates are August 13, 20 and 27 from 7:00-10:00 PM. Tuition is $50.50 ($40.50 for Science Center members).

Call Merial Scott at Pacific Science Center, 382-4412, to register and to receive information about other classes for students aged 4 through adult.

Book Reviews

IVIES, by Peter Q. Rose. Blandford Press, Poole, Dorset, England, 1980. 180 pages, 71 color plates. Hard cover. Price 6.95 pounds or approximately $16.00.

With the exception of *The Ivy Book* by Suzanne W. Pierot (Macmillan, 1974), this is the only book written and published in this century on the subject of ivies. Considering the increasing use of these plants nowadays in both private and public gardens and along our highways, it is opportune and welcome. In its pages, 125 species or cultivars are described and over 60 of these illustrated by excellent color plates, of which 54 are close-up samples of leaves with both inch and centimeter scale included on each. The remainder of the plates show various uses of ivies in gardens.

The previous authority on this genus was Shirley Hibberd, who authored *The Ivy,* published in 1872 (second edition, 1893). He was not a botanist, and he ignored earlier published names, replaced them with others of his own, and thus caused much confusion for many years. Fortunately, a botanical monograph, *Die Gattung Hedera,* was published in 1912, at Jena, Germany, by Friedrich Tobler, as well as more recent authoritative articles in such journals as the *National Horticultural Magazine* (1932-1945), *Gentes Herbarum* (1942), and the *Bulletin of the Morris Arboretum* (1956). These have done much to correct the errors in nomenclature.

Mr. Rose's studies over the past 12 years now bring together all the available information on both older and more recent types of ivies. As he says in his introduction, "In this book it will be seen that considerable attention is given to defining the correct name and giving an accurate description," which is certainly what is needed both in ivies as well as in other commonly grown genera of plants. The author expresses his indebtedness to various authorities and collections both in Europe and in the United States for information and material received, thus making this an international undertaking. New forms of ivies should now be registered with the headquarters of the American Ivy Society, Cox Arboretum, 6733 Springboro Pike, Dayton, Ohio, 45449.

There is a chapter on the nomenclature and the natural distribution of the genus in the Old World (Europe, Asia, North Africa and the Atlantic Islands). This is followed by one on the many uses of ivies in gardens as well as on walls or buildings, which they can safely cover if annually sheared. Mr. Rose states, "Ivies will grow on south-facing walls but are very much more suitable for north, east or west aspects." The chapter on cultivation includes details of propagation, preferred soil types (alkaline), and pests and diseases, which in most gardens are fortunately few and generally controllable.

The bulk of the book (pages 41 to 160) is occupied by the section, *Descriptive Notes: Species, Varieties and Clones,* which treats the species and their many variations in strict alphabetical order, beginning with *canariensis* and its cultivar 'Azorica' and concluding with *H. rhombea* 'Variegata'. The color photos of the foliage are likewise conveniently arranged alphabetically. From them one can discover such facts as the

differences between *H. helix* 'Congesta', 'Conglomerata' and 'Erecta'; 'Deltoidea' and 'Sagittifolia'; the uncertain origins of 'Hibernica' and 'Goldheart'; and the proper name of what we have been calling 'Meagheri', which is 'Green Feather'. There are also descriptions of all the more recent European and American introductions.

The work concludes with: 1) a short glossary of botanical terms, 2) a map showing plant hardiness zones in the United States, copied from the USDA Research Service map of 1960, 3) two pages of drawings of leaf shapes, 4) a select bibliography, 5) alphabetized lists of green-leaved and variegated ivies, 6) an index of names of ivies mentioned in the book, and 7) a general index of persons, places and subjects.

This is an admirable example of a practical small book concerning one genus of common garden plants. It is well planned from its dust cover with an ivy design running over it, down to the index of ivies set in four different types, emphasizing in bold face those described in the text. The only regrettable omission I noticed was the lack of any list of the color plates or references to them in the text. This should be a particularly useful publication for horticulturists to check the names and identities of their plants. It is anticipated that copies will be available through the Arboretum Foundation office as soon as they can be imported from the publisher. *BRIAN O. MULLIGAN*

STUDIES IN THE GENUS RHODODENDRON, Vol. I & Vol. II, by Johannes Hedegaard. G.E. Gad Publishing House, 32 Vimmelskaftet, DK 1161, Copenhagen K., Denmark, 1980. 757 pages, illustrations. Price DKr 601.25 (approximately $91.50).

Mr. Hedegaard has outstanding ability both as an artist and as a scholar. With this happy combination he has given us a publication of great merit. Without question, this work will have great value to those engaged in taxonomic research on the genus *Rhododendron.* In addition, this book is so beautifully illustrated and each detail is so carefully explained that it will have equal value to those of us who would just like to know what the experts are talking about.

When Mr. Hedegaard first became interested in Rhododendron botany in 1963, he soon encountered frustration and uncertainty in his attempts to identify the species by using the existing keys and descriptions. Realizing that the present classification system relies mainly on floral characters which can be variable and may be observed for only a short time, and that little study had been done on seed, fruit and seedlings which can be observed for most of the year, he decided to undertake an extensive microscopic survey of the morphology of these plant parts for the genus *Rhododendron.* The objective of these investigations was to find the criteria with which to identify a species more easily and reliably and at the same time provide a sound foundation for a more accurate description of the species.

This work consists of two volumes treating 300 species. For each of the species studied, there is a description of the seeds, the fruits, the seedlings and the hair types present. The form and structure of each of these plant parts is illustrated with line drawings of superb quality. The species descriptions are prefaced by a section in which the terminology is clearly defined and fully illustrated by explanatory drawings. Even the amateur should be able to use these books without difficulty. In addition, the second volume contains a survey, in tabular form, of the hair types found on the capsules and the seedlings of all the species studied. This is a very welcome and much needed addition to our knowledge of this genus and deserves a place in any collection of reference material on this subject.
ESTHER BERRY

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New Members of the Arboretum Foundation

We are pleased to welcome the following new members (October 1, 1980 through January 31, 1981): *Family*— Richard B. Anderson, Brian Brubaker, Mrs. Shirley Earl, Mr. & Mrs. John Frykholm, Mr. & Mrs. Rodney Parker, Ilser Penton. *Sustaining* — Mrs. Paula Goad, L.B. Gold & S. Caussuto, Mr. & Mrs. Scott Pascoe. *Contributing* — Sarah Jane Johnson. *Annual* — Michael Adams, Nancy Adolfson, Marjorie Aldrich, Mrs. T.N.K. Allan, Susan E. Armitage, Mrs. Jean Arons, Mary Bailey, Carolyn Baker, Mrs. Wm. Baldwin, Mrs. Christa Balk, Lynne Bannerman, Mrs. Catherine Barrett, Mrs. Dudley Beck, Ruth Benoliel, Mrs. John Benson, Mrs. Frances Blasko, Mrs. Susan Boettiger, Mrs. Eva Boot, Mrs. John Bouchaert, Sheila Brouth, Mrs. J.E. Buckley, Ruth Bunger, Mrs. R.D. Cairnes, Eleanor Carnwath, Patricia Anne Chase, Mrs. Richard Chesarek, Margaret Christofferson, Ann

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CALENDAR OF EVENTS

The Arboretum Foundation and Unit Council Meetings will take place again in September.

Most study groups meet irregularly in the summer. For regular times, the reader is referred to previous issues of the *Bulletin*.

SECOND SUNDAYS PROGRAM, VOLUNTEER PARK CONSERVATORY, 1-4 PM (see page 14)

CLOUD FLOWERS: RHODODENDRONS EAST AND WEST (see page 14)
University of British Columbia, May 5 - August 14

FREE PUBLIC LECTURES: PLANTS IN THE ARBORETUM (see page 35)
September 30: Berries and Fruits for Fall Color
October 21: Fall Foliage Color

ARBORETUM FOUNDATION FALL BULB SALE
Wednesday and Thursday, October 7 and 8; Arboretum Office Parking Lot

NOHS FALL PLANT SALE: In October, Museum of History and Industry

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***Eucryphia glutinosa,* a South American evergreen shrub, blooming in July. Photo: B.O. Mulligan**

VISIT YOUR ARBORETUM IN SUMMER

See Eucryphia and the other Camellia relatives which flower in summer.

Hydrangeas and *Oxydendrum arboreum* burst into bloom at this season.

Visit the newly rebuilt Tea House in the Japanese Garden, and enjoy the carp in the placid pool, symbolic of the Inland Sea.

Join the Explorers' Walks, meeting at 10 AM every fourth Wednesday of each month, in the Administration Building Parking Lot: June 24, July 22, August 26, September 23.